NETWORK WORLD

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CrossComm to build up IBM's APPN

By Maureen Molloy
Senior Writer

MARLBOROUGH, Mass. — CrossComm Corp. last week became the second router vendor to license IBM's APPN Network Node, saying it will offer by year end an enhanced version of the technology that will be faster and more dynamic.

The enhancements will overcome the two key deficiencies of Advanced Peer-to-Peer Networking and enable any Systems Network Architecture device on a CrossComm ILAN router-based internet to efficiently communicate as a peer with any other SNA device.

CrossComm, which purchased the Network Node license for $400,000, said it will combine APPN with its own Protocol Independent Routing (PIR) software to provide nondisruptive routing of APPN.

The combination of APPN and PIR will make it possible to more quickly and reliably transport SNA and token-ring traffic across a local-area internet.

The PIR software takes advan-

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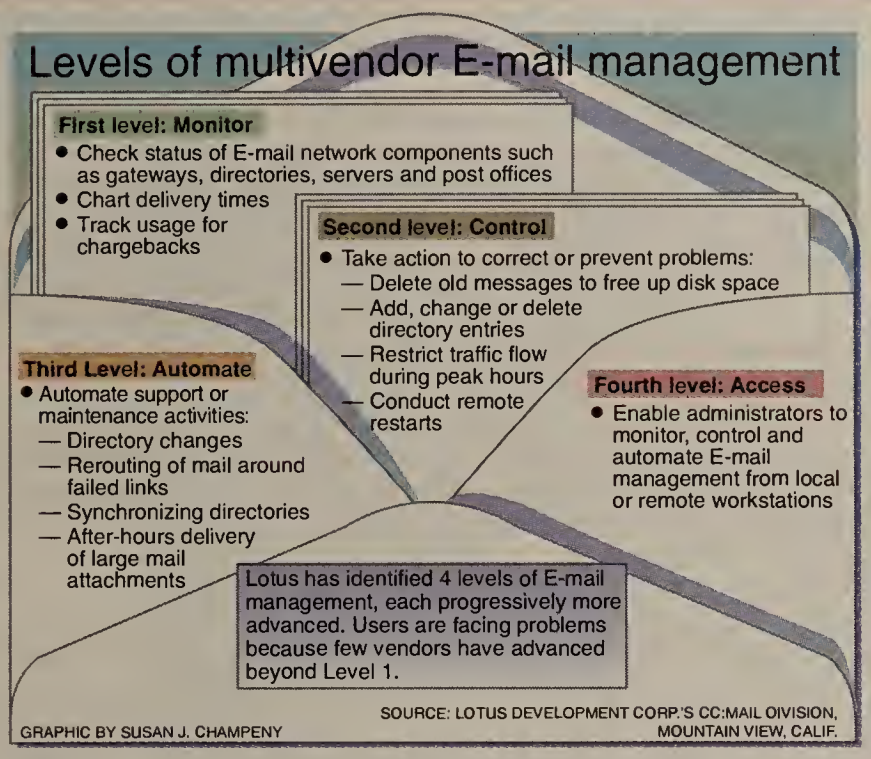

Users demanding help in managing big E-mail nets

By Bob Brown
and Wayne Eckerson
Network World Staff

Gregg Lauderbaugh, project manager for Baxter Healthcare Corp., learned it's easier to build a corporate E-mail network than manage one.

To support multiple electronic mail systems and 5,000 users worldwide, Baxter has been forced to develop its own programs that track addresses and equipment and ensure acceptable uptime and reliability.

"We've had to build our own tools to automate and manage our E-mail network because there are few products on the market," Lauderbaugh said.

Other users agreed and said they have started pushing suppliers to deliver new management tools. Vendors are starting to respond, but they acknowledge there is much work to be done.

Given the growing size, com-

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Hughes takes off with ATM net plan

Defense firm issues RFPs for corporate ATM net to support new generation of applications.

By Bob Brown
Senior Editor

EL SEGUNDO, Calif. — Hughes Aircraft Co. last week threw its weight behind Asynchronous Transfer Mode (ATM), issuing requests for proposals for what could become one of the first big corporate ATM networks.

A key piece of a reorganization designed to keep the company competitive, the network will serve as a common platform for applications across all Hughes business units, linking or replacing a hodgepodge of older nets.

"The executives want to make the company more interoperable and capable of executing business across its major sectors," said George Buchanan, manager of telecommunications for Hughes, which employs 65,000 people. "Unless I'm successful with this network, Hughes Aircraft is not going to be able to function the

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ATM inches nearer with moves by AT&T, Sprint

AT&T service plans leave some wondering.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — As expected, AT&T last week outlined its plans for Asynchronous Transfer Mode-based services but stopped short of revealing deployment and pricing information users say they need to formulate ATM plans.

The carrier said at the ComNet '93 conference here that it will begin offering a 45M bit/sec ATM-based service to selected users in the first half of 1994 and hopes to make it generally available by the end of that year ("AT&T to announce ATM service rollout at ComNet," *NW,* Feb. 1).

The InterSpan ATM service will be sold through customer-specific contracts rather than a general tariff — an approach AT&T takes with other InterSpan services, including frame relay.

InterSpan ATM will be deployed from a variety of switching platforms, including StrataCom, Inc. IPX T-1 fast packet

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Sprint/Alcatel venture will build ATM switches.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Sprint Corp. last week announced a joint venture with French manufacturing giant Alcatel N.V. to develop an Asynchronous Transfer Mode switch for end users and small carriers.

The venture, dubbed Alcatel Data Networks (ADN), will be 51% owned by Alcatel and 49% owned by Sprint, with headquarters in Paris and a major U.S. location in Reston, Va.

Both companies will jointly own, market and distribute products developed at ADN, including other offerings such as LAN bridge/routers, local-area network management systems, packet switches and frame relay equipment.

Alcatel has an early version of an ATM switch being beta-tested in France, and ADN will build on that work, according to Jacques Dunogue, president of Alcatel CIT's Networks and Services Division. Dunogue said the new ATM switch, which will

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NET offers scaled-back SONET mux

By Jim Duffy
Senior Editor

WASHINGTON, D.C. — Responding to a cool market reception for its high-end SONET multiplexer, Network Equipment Technologies, Inc. (NET) last week rolled out a scaled-down version that supports less than half the number of T-3 links of its predecessor.

NET also used ComNet '93 here to unveil a new software release for its IDNX router module, the LAN/WAN Exchange (LWX), that adds support for IBM Synchronous Data Link Control tun-

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NETLINE

FEATURES

Experts outline strategies that will aid users in ridding networks of nagging printing problems. Page 29.

NEWSPAPER

IBM shores up multivendor net management offerings

Offers entry-level SNMP system and new mgmt. applications plus enhancements for 6611 router.

By Michael Cooney
Senior Editor

WASHINGTON, D.C. — IBM used the ComNet '93 show here last week to drive home its multivendor net management message with the announcement of a new low-end version of its SNMP manager and hooks between the host-based NetView and BT's Concert.

As expected, the enhancements included an Entry version of IBM's AIX SystemView NetView/6000 management platform and a new IBM NetView/6000 application ("IBM plots net mgmt. rollout for ComNet," *NW*, Jan. 25). IBM also said it has shipped software enhancements for the IBM 6611 Network Processor router, including Apple Computer, Inc. AppleTalk support.

NetView/6000 Entry Version 1, which runs on IBM's RISC System/6000, is a Simple Network Management Protocol-based system for managing Transmission Control Protocol/Internet Protocol networks with as many as 32 nodes. The original NetView/6000 program can support an unlimited number of nodes.

For less money, the Entry version contains all the features of

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Canadian carrier first in line for Cisco 7000 router

Device to link data centers, handle incoming traffic.

By Maureen Molloy
Senior Writer

TORONTO — Canadian long-distance carrier Unitel Communications, Inc. last week became the first user to install Cisco Systems, Inc.'s next-generation 7000 Internetwork Router in a nationwide production internet.

The company is using a pair of the routers to link two data centers here as well as to accommodate traffic fed in from existing Cisco routers in more than 50 locations across Canada. Imran Bashir, Unitel's manager of systems integration, said the 7000 answers his need for high availability to ensure the resiliency of Unitel's net.

"The bulk of the data that travels across the internet is used to manage our switches and cross-connect systems," he said. "Reliability is critical because the internet manages the communications facilities we sell to our customers."

Cisco last month announced the next-generation router platform, which promises significant performance and reliability improvements over its 6-year-old AGS+ model ("Router makers strive for greater heights," *NW*,

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Videoconferencing rollouts abound at ComNet show

By Joanne Cummings
Senior Writer

WASHINGTON, D.C. — Last week's ComNet '93 show here hosted a slew of videoconferencing announcements aimed at easing conference setup, management and multisite support.

PictureTel Corp. and Compression Labs, Inc. (CLI) both introduced multipoint bridges with increased functionality, while AT&T announced a videoconferencing management service, and Sprint Corp. unveiled gateway service enhancements.

CLI's new Multipoint 2 bridge, engineered with VideoServer, Inc., is a 28-port unit that supports the emerging CCITT standard for multipoint videoconferencing, enabling 28 CLI or non-CLI sites to be in a single session.

A cascading feature will be added later this year, enabling the bridge to be linked to several others and support more than 100 users simultaneously.

The Multipoint 2 supports line speeds of 56K to 2M bit/sec and can handle as many as 12 112K bit/sec coder/decoder connections over one T-1 line. Available in April, it ranges in price from $110,000 to $150,000, depend-

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Briefs

Sprint goes all out on 800. Sprint Corp. last week announced a satisfaction guarantee under which customers that are unsatisfied with its 800 service within 90 days can receive a refund of up to $50,000, including access charges. Sprint also announced a new 800-routing feature, Network Call Distributor, that allows customers to reconfigure 800 routing plans on a real-time basis from a workstation on their premises. The service will be available this summer.

Mushrooming middleware. Digital Equipment Corp. last week announced it has ported its Application Control Architecture (ACA) Services to four new operating environments: IBM's AIX, Hewlett-Packard Co.'s HP-UX, Apple Computer, Inc.'s Macintosh System 7 and DEC's OpenVMS for Alpha AXP. ACA Services, which is middleware that helps programmers forge links among distributed applications, was previously available on DEC's OpenVMS for VAX and Ultrix, as well as Microsoft Corp.'s Windows and Sun Microsystems, Inc.'s SunOS.

MCI launches toll fraud program. MCI Communications Corp. last week announced MCI Detect, a family of services and products to help users detect toll fraud. Included are customer awareness and education programs, fraud detection equipment, traffic analysis and third-party insurance.

OSF to test for DME compliance. Plugging a hole in its Distributed Management Environment (DME) strategy, the Open Software Foundation, Inc. (OSF) last week said it will test DME implementations for interoperability and conformance to the specification. OSF President David Tory said DME services, which support software licensing and distribution, print service and event handling, are to be released on schedule in September. The DME framework is still scheduled for a December release.

HP goes for commonality. Hewlett-Packard Co. last week said it has developed software that allows its OpenView management applications to share asset and event information on devices in Systems Network Architecture, DECnet and NetWare networks. The software, which will be used in third-party management applications, is intended to help users employ a common trouble-ticketing mechanism for the three environments.

NetWare on SPARC? Analysts last week said they expect Novell, Inc. and Sun Microsystems Computer Corp. to announce this week an agreement under which the companies will port NetWare to Sun's scalable processor architecture computer platform. Novell entered into a similar agreement with Hewlett-Packard Co. more than a year ago, but today, native NetWare still runs only on Intel Corp. X86-based machines. Unix versions of NetWare are available from other vendors but are said to be lacking in performance as compared to native NetWare.

Quello gets interim shot at top FCC post. As expected, President Clinton last week nominated Federal Communications Commissioner James Quello as interim FCC chairman pending the selection of another candidate to hold that position permanently.

IBM, Gupta pair. IBM and Gupta Corp. last week announced an agreement under which IBM will sell Gupta's Application System/400 products, called SQL Windows for AS/400 and SQLRouter to AS/400.

CONTACTS

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"Please stay on the line. Your call will be answered in the order in which it was received. Thank you for holding. This message will repeat."

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Ford, MCD accept awards

WASHINGTON, D.C. — Network executives from Ford Motor Co. and the Medical Center of Delaware (MCD) took center stage during last week's ComNet '93 to accept *Network World*'s Eighth Annual User Excellence Awards.

MCD's Stan Fiedor and (r.) Ward Keever

The awards, announced at a keynote session of the annual networking conference here, honor organizations for innovation in applying network technology to achieve business goals.

Joseph Phelan, manager of supplier communications at Ford's Purchasing & Supply Division in Dearborn, Mich., accepted for the automaker, which was recognized for its pioneering work in establishing interactive communications with suppliers.

MCD, honored for its deployment of internetworked local-area nets supporting integrated health care applications, was represented by Senior Vice President Ward Keever and Stan Fiedor, manager of data communications.

Also recognized were eight organizations that earned honorable mention: Avon Products, Inc.; Charles Schwab & Co., Inc.; Complete Health, Inc.; The Foxboro Co.; Intermountain Health Care; Northrop Corp.; Texas A&M University; and the University of Miami.

PHOTOS © 1993 GREG HADLEY

Ford's Joseph Phelan

Industry leaders looking to start-up General Magic

Will use its personal communications technologies.

By Ellen Messmer
Senior Correspondent

MOUNTAIN VIEW, Calif. — Industry giants from the U.S., Europe and Japan this Monday threw their weight behind technology licensed by start-up General Magic, Inc. for a new generation of personal communications equipment.

Apple Computer, Inc., AT&T, Matsushita Electric Industrial Company, Ltd., Philips N.V., Motorola, Inc. and Sony Corp. — which have all taken equity shares in the new venture — said they will incorporate General Magic's core technologies into future products. The goal is to create a new line of interoperable wireless hand-held devices for both voice and data applications that work well over local-area nets and other physical medium.

General Magic, spun off from Apple Computer in 1990 to focus on personal communications devices, entered the limelight this week as the company disclosed the two core technologies it will license to other vendors.

Telescript, General Magic's programming language and software for communications, is imbedded in the company's second licensed technology, Magic Communicating Applications Platform (Cap). Magic Cap, with its user interface and object-oriented approach, is designed to let software developers write applications with wireless support.

General Magic

None of the partners in the General Magic alliance appeared ready to discuss specific product plans, although AT&T said it will integrate Telescript into its EasyLink Services to support General Magic-based applications sent between different brands of personal communicators.

AT&T said it considers Telescript a strategic communications specification that it would like to see become an accepted global standard, said Dan Rosen, vice president of EasyLink Services. "Telescript is to messageing what PostScript is to printing," he said.

"Our alliance partners will create products and services using General Magic technologies that will help people remember, communicate and know things in a new and powerful way," said General Magic President and Chief Executive Officer Marc Porat.

Pat Richardson, vice president and director of business operations for personal messaging products at Motorola, said the company is working on a new line of personal communicators and promised product demonstrations later this year. "There's an opportunity for a new industry based on easy transfer between equipment and services," he said.

Advantis adds outsourcing, LAN internetwork service

By Michael Cooney
Senior Editor

WASHINGTON, D.C. — Advantis is taking a stab at helping users build multivendor LAN internets with a new portfolio of outsourcing services announced last week at the ComNet '93 show.

The new services, Custom Network Solutions and LAN Internetworking Solutions, promise to help users build customized multivendor internetworks using the new Advantis Transmission Control Protocol/Internet Protocol backbone, also announced last week.

IBM and Sears, Roebuck and Co. formed Advantis last August to compete as one of the world's largest value-added network companies. Advantis is majority-owned by IBM and run by Integrated System Solutions Corp., IBM's systems integration arm.

The Custom Network Solutions will be Advantis' primary outsourcing service. Advantis will help users with net design, implementation and operation while managing the equipment connected to the Advantis backbone.

"In the past, we basically provided a network cloud for users to plug into," said Martha Diaz, a representative with Custom Network Solutions marketing at Advantis. "Now we will help them build the network to connect to that cloud."

Diaz said the Custom Network Solutions service will focus on interconnecting local-area networks rather than providing traditional data center services such as IBM's Information Network, which it offered in the past.

The LAN Internetworking Solutions service is the company's first foray into multiprotocol internetworking. Advantis has built a TCP/IP-based backbone that it will use to provide LAN-to-LAN interconnection for Ethernet and token-ring nets.

In addition to TCP/IP, the service supports Systems Network Architecture, Network Basic I/O System and Novell, Inc.'s Internetwork Packet Exchange (IPX) protocols.

Connections to the backbone can be achieved through any router that supports the point-to-

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The future of the Internet pondered on two fronts

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The future of the Internet was the focus of discussion at two forums here last week, one at the ComNet '93 trade show and the other on Capitol Hill.

At a special ComNet panel session cosponsored by *Network World* and the show organizers, speakers predicted that Internet service prices would fall when federally subsidized Internet backbone services for general-purpose use are phased out.

They praised the National Science Foundation's (NSF) decision to restrict the next-generation NSFNET backbone to supercomputer applications rather than creating another general-purpose Internet backbone, saying competitors will rush to win the job of linking the regional networks. The sites are currently linked via a subsidized backbone run by Advanced Network & Services, Inc.

"It's time for the government to get out of the business of supporting a federal backbone," said Steve Wolff, director of networking at NSF.

Wolff also said the end of the Acceptable Use Policy (AUP) may be at hand. The AUP prohibits transmission of commercial data traffic across the federally subsidized NSF backbone.

Wolff said the AUP prohibition only applies when the government is subsidizing the network supplier directly and not when the user receives the subsidy directly. The end of the AUP restrictions is likely to fuel an explosion in business use of the Internet.

For carriers ready to offer Internet access, the NSF decision means greater opportunity and competition. "Competition will drive costs down," said Vinton Cerf, director of the Corporation for National Research Initiatives.

Tony Rutkowski, vice president of new technology at Sprint Corp., and Erik Grimmelmann, marketing director of Internet and the National Research and Education Network (NREN) at AT&T, said their companies are ready to step in and fight for new business.

Across town, users and vendors at an oversight hearing of the House Subcommittee on Science chaired by Rep. Rick Boucher (D-Va.) charged that the program funding the upgrade of the Internet to gigabit speeds is uncoordinated and mismanaged.

Representatives from Educom, the Federation of American Research Networks (FARNET) and others backed the NSF's plan to eliminate the NSFNET backbone but assailed the year-old High-Performance Computing and Communications (HPCC) program. They said HPCC — which includes the NREN — is a poorly managed effort in which federal agencies are consuming millions of dollars with no visible results.

Kenneth Kay, executive director of the Computer Systems Policy Project, told Congress that there is a lack of coordination among the eight agencies funded under HPCC research. "It's eight preexisting government missions with a ribbon tied around it," said Kay, whose organization represents some of the computer industry's top executives.

Kenneth Klingenstein, director of computing and network services at the University of Colorado in Boulder and spokesman for FARNET, said the agencies do not share a common vision of the NREN nor do they agree on their roles in federal networking. "The agencies have individually funded programs without building on each other's successes, and there are significant gaps in responsibility that reduce the program's effectiveness," he said.

Boucher said he will soon introduce legislation in the House as a follow-on to HPCC that will have tighter accountability and a clearer technical focus. That bill will differ from the Senate HPCC bill recently introduced (see "Bill would help put U.S. back in high-tech game," page 21), so the two sides will need to iron out their differences before any legislation becomes law.

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USL plots NetWare course for its Tuxedo TP monitor

By Wayne Eckerson
Senior Editor

SUMMIT, N.J. — Officials at Unix System Laboratories, Inc. (USL) last week disclosed new features of an upcoming release of its Tuxedo transaction processing system and discussed the impact that USL's acquisition by Novell, Inc. will have on the product's future direction.

Tuxedo is Unix-based software that manages the interaction between multiple clients and servers in high-volume, transaction-based application environments.

Jennie Grimes, Tuxedo product marketing manager, said USL will soon begin exploring how to run Tuxedo as a NetWare Loadable Module that supports native NetWare protocols. Currently, NetWare clients can access Tuxedo servers via Transmission Control Protocol/Internet Protocol using Novell's LAN Workplace for DOS, which runs on NetWare clients.

"We started talking with Novell three years ago, and [porting Tuxedo to NetWare] always seemed like a logical thing to do," Grimes said. "There are many people on LANs who now want to access Unix databases but can't. A Tuxedo NLM gives these people an upsizing strategy.

However, Grimes admitted that porting Tuxedo to NetWare would not be easy since Tuxedo was designed from the ground up to run on Unix. "Tuxedo was developed to take advantage of certain capabilities in Unix that aren't available in other operating systems. It's not a match made in heaven," she said.

New enhancements

On tap for next week is Tuxedo Version 4.2, which incorporates message queueing, Dynamic Linked Libraries (DLL) under OS/2 and Windows, and a COBOL application program interface (API).

Message queueing will enable Tuxedo to write transactions or messages to disk and process them at a predefined time or when a target server becomes available. If a server or network connection fails in the middle of a transaction, USL's /Q software will resubmit the message from disk as soon as the downed processor comes back on-line — guaranteeing data and transaction integrity. Message queueing will also be used to support work flow and event-driven applications as well as batch processing.

Support for DLL will enable Tuxedo users to dynamically load libraries into memory and execute them as needed. Current versions of Tuxedo only support static libraries, which means users have to load an entire program, such as a spreadsheet, into memory instead of just the service or function needed.

Version 4.2 will also support a COBOL API, which is based on Information Builders, Inc.'s Micro-Focus COBOL product. The new API will make it easier for COBOL developers to build Tuxedo transaction processing applications.

Inference object-oriented development tool debuts

Product helps users build client/server programs.

By Wayne Eckerson
Senior Editor

BOSTON — Inference Corp. introduced an object-oriented client/server development tool at Object World '93 here last week that lets users build applications that run on personal computers, Unix-based systems and mainframes.

Called Automated Reasoning Tool (ART)*Enterprise, the tool will be available in September for Microsoft Corp. Windows-based computers but will soon thereafter ship on nine additional computing platforms, including Apple Computer, Inc.'s Macintosh, OS/2, Unix and IBM MVS, according to company officials.

ART*Enterprise supports the basic components of object technology, including object definition, data modeling and encapsulation. Its object orientation enables developers to build graphical user interface (GUI)-based applications that can run without reprogramming on any platform supported by the software.

The new tool also incorporates expert systems technology contained in previous Inference products and supports case-based retrieval tools that let users scan files of unstructured data, such as image and text, to find words or numbers that match a search string.

"This is a powerful tool because Inference has leveraged its expertise in artificial intelligence to build a fully object-oriented client/server development tool," said Paul Harmon, editor of the "Intelligent Software Strategies" and "Object-Oriented Strategies" newsletters in San Francisco.

Beta user Andersen Consulting is using ART*Enterprise instead of other fourth-generation language tools, such as Powersoft Corp.'s PowerBuilder, because it needs a full object-oriented development environment. The company is using ART*Enterprise to build a client/server, multimedia-based commercial loan support system, among other things.

"PowerBuilder is great for building a user interface, but you need to do extensive C programming to handle the back-end logic we're building into applications," said Joe Carter, a partner at Andersen Consulting in Chicago. "ART*Enterprise has all the tools we need — message passing, inheritance, case-based searches, four-chain reasoning — so we don't have to do C coding or jump from one tool to another or interface to an [application program interface]."

Carter added that since ART* Enterprise supports Microsoft's Dynamic Data Exchange and Dynamic Link Libraries, developers can easily integrate ART*Enterprise applications with other applications, such as Microsoft's Multimedia Windows, or other environments, such as Microsoft's Windows for Workgroups peer-to-peer networks.

ART*Enterprise comes with a screen painter and a GUI class library that includes objects for pop-up windows, menus, list and drop-down boxes, buttons and scroll bars. Developers can assemble these objects into a custom GUI by pointing and clicking on a mouse.

Users can also utilize point-and-click selections to browse, query and update a variety of database management systems as well as to perform joins across DBMSs.

The software supports databases from Oracle Corp., Sybase, Inc., Informix Software, Inc., as well as IBM's DB2 and Borland International, Inc.'s Paradox and dBase.

ART*Enterprise applications connect to databases using standard APIs, such as Microsoft's Open Database Connectivity or DBMS connectivity options.

Pricing for ART*Enterprise starts at $6,995 per seat. Users of Inference's ART-Information Management will be upgraded to ART*Enterprise at no charge.

SMDS group approves spec for using frame relay access

Will make service appealing to more customers.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — The Switched Multimegabit Data Service Interest Group (SMDSIG) approved specifications at the ComNet '93 conference here last week that detail how companies can use frame relay for low-speed access to SMDS.

The move is considered to be a watershed event in the evolution of SMDS because it will make the service attractive to users that cannot otherwise justify the cost of the high-speed data service. "Low-speed frame relay access to SMDS could make the service available to the masses," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. "The hospital that wanted to use SMDS at its main sites could bring suppliers, radiologists and doctors aboard an SMDS network."

SMDS is a high-speed, packet-oriented service capable of supporting transmission speeds between 1.544M and 155M bit/sec. It currently requires T-1 access, which is overkill for many small companies and the small offices of large companies.

The specifications, approved by the SMDSIG at a meeting held at ComNet, defined frame relay access to SMDS at 56K and 64K bit/sec. They will likely be revised over time to include speeds up to T-1.

Nolle said the acceptance of frame relay as a way to access SMDS depends largely on how carriers price the frame relay links. "If [carriers] price frame relay access below $250 a month per site, almost any user can justify using it for any LAN interconnection application," he said.

If links are priced lower, use of SMDS could skyrocket, Nolle noted. "If they set [the price] at or below $150 per site per month, far more applications will be opened up, including access to information services," such as Dow Jones Information Services Group, CompuServe, Inc., Prodigy Services, Inc. and Quotron Systems, Inc., he said. "That pricing would also work wonders for telecommuting."

However, pricing substantially above $250 a month would require net managers to develop a formal cost-justification plan.

Nolle's "willingness-to-pay" figures are based on continuing surveys of the wide-area network needs of 267 U.S. firms.

OLE-based image mgmt. software cuts time, costs

By Joanne Cummings
Senior Writer

Watermark Software, Inc. last week unveiled a Windows-based image management system that enables LAN users to image-enable applications quickly and inexpensively.

The software relies on Microsoft Corp.'s Windows Object Linking and Embedding (OLE) technology to add image objects to OLE-compliant applications such as Beyond, Inc.'s BeyondMail for Windows and Borland International, Inc.'s Paradox for Windows.

"Most users have already chosen their electronic mail system and their database system," said David Skok, chief executive officer of Watermark. "[This] enables them to add imaging to their applications without swapping out their investment."

Skok said the product, called Watermark, does not come with work flow software but will work with packages from other vendors, such as Reach Software Corp. and Lotus Development Corp.

Watermark is client/server software. The client runs on any Windows-compliant personal computer and enables users to view images and add them to other applications. The server component runs on any local-area network server, such as Novell, Inc. NetWare and Banyan Systems, Inc. VINES boxes, and stores and retrieves the images.

To add an image to an E-mail message, for example, users type the message as they normally would but then call in the image using a new "add object" menu option available on OLE-compliant E-mail packages.

When "image" is selected as the object type, the OLE feature loads Watermark, and users can

(continued on page 43)

Users demand help managing E-mail

continued from page 1

plexity and strategic importance of E-mail nets, as well as the downsizing of mainframe- and minicomputer-based mail systems to local-area nets, management is becoming a critical issue.

"E-mail is expected to be used increasingly to carry strategic business information and to transport commands between applications," said John Rymer, a vice president at the Patricia Seybold Group, Inc., a Boston consultancy. "Without management, this type of messaging won't fly."

Users want products that can centrally update directories, monitor traffic and control E-mail net components, such as gateways and message transfer agents (MTA). They also want tools for handling chargebacks, file attachments and remote users, as well as have such tools be better integrated with existing management systems.

Toward that end, Baxter has designed one program that automatically checks the status of modem pools dedicated to remote E-mail users and another for updating its central and outlying E-mail directories. One of the few commercial products it uses is an offering from Automated Business Solutions, Inc. of Columbia, Mo., that monitors communication between the company's E-mail hub and remote post offices.

The biggest headache for JP Morgan & Co., which has seven E-mail systems serving 14,000 employees worldwide, is keeping directories synchronized.

"Managing directories is time-consuming and requires lots of manual intervention," said Penny McLaughlin, manager of global messaging and E-mail integration at JP Morgan.

The firm has written batch programs for updating individual directories and storing updates centrally, but remote LAN administrators must import the changes to their local mail systems.

An E-mail manager at another Northeastern financial services firm who requested anonymity said E-mail vendors need to provide tools that can "isolate application problems from network problems." Several times, E-mail server files have been corrupted by what the E-mail manager suspected were network bugs.

Chuck Stegman, product manager for Lotus Development Corp.'s cc:Mail division, said most E-mail vendors are only beginning to deploy tools for monitoring their own E-mail systems, never mind other vendors' (see graphic, page 1).

The cc:Mail division is building features into its E-mail software that automate administrative procedures, such as handling backups of remote E-mail servers and deleting old messages. For integrated net and E-mail management, Stegman said some users want cc:Mail to incorporate Simple Network Management Protocol agents so users could monitor the status of both E-mail and network components via existing SNMP-based managers.

Retix, a Santa Monica, Calif., E-mail software vendor, has also jumped into the management fray with new software that uses Retix X.400 gateways to enable directory synchronization across multiple E-mail systems.

Another new package provides centralized management of the company's OpenServer 400 MTAs and will be enhanced to support other vendors' MTAs.

Hewlett-Packard Co. plans to support E-mail management under its OpenView net management platform and has demonstrated an OpenView application for managing HP X.400 MTAs. HP is working with users to determine which features to support and has yet to set a date for product availability.

Soft-Switch, Inc. of Wayne, Pa., offers Mail Monitor, a personal computer-based tool that ensures E-mail net components are active and details how long it takes messages to reach their destination.

While Mail Monitor lets administrators respond more quickly to problems, it does not isolate, troubleshoot or give managers the ability to resolve them. Soft-Switch has begun to provide some of those tools in its Unix-based Enterprise Mail Exchange hub.

More E-mail management help is on the way from the standards community. The International Federation of Information Processing, a professional group, is attempting to put together a set of multivendor E-mail management standards by mid-year, which it hopes to see adopted as an international standard.

Correction: IBM's future Advanced Peer-to-Peer Networking high-performance routing technology moves APPN routing down to Layer 3, the network layer, not Layer 4, as was stated in the article "New features to shore up IBM's APPN," (*NW*, Dec. 21, 1992).

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Worth Noting

"All of those consultants who say NetView isn't or can't be a manager of managers are our targets."

Carl Vanderbeek
President
Automated Network Management, Inc.
A vendor of IBM NetView-related management tools

Data Packets

MAXM Systems Corp. of Vienna, Va., last week announced a new scripting language for its MAXM net and systems management software that enhances the product's automation capabilities.

The scripting language allows users to write event-driven and scheduled automation routines for IBM RISC System/6000-based MAXM servers and attached OS/2-based management consoles.

The automation routines allow those systems to automatically monitor the status of network and systems resources, extract a variety of fault, performance and utilization information from devices and element management systems, reset devices and reroute traffic — all without human intervention.

The scripting language is available now as a free upgrade for MAXM users.

Nitech of Freehold, N.J., last week unveiled a network testing system for T-1, X.25 and frame relay networks.

The NiteOwl Test Set Series is based on an Intel Corp. i386 personal computer with a Windows graphical user interface. It simulates and analyzes the performance of packet- and circuit-switching equipment and lines.

NiteOwl, available now, costs about $25,000.

New Telenex matrix switch adds flexibility, cuts costs

Enables links between LAN and WAN devices.

By Jim Duffy
Senior Editor

MOUNT LAUREL, N.J. — Telenex Corp. last week rolled out a matrix switch designed to provide configuration flexibility and reduced equipment costs by forging links between a variety of devices over local- and wide-area networks.

The Model 2700 LAN/WAN Matrix Switch allows users to establish connections between workstations, file servers, front-end processor ports, media access units (MAC), hubs, bridges, routers and protocol analyzers. Included among its features is the ability to automatically restore mainframe sessions if a multidrop line connection is lost and support for virtual LAN configurations that provide configuration flexibility and redundancy.

The Model 2700 features a total switching capacity of 20.5G bit/sec, or 16M bit/sec per port. It supports 128 LAN and WAN modules, sporting up to 2,048 token-ring LAN ports, 4,096 WAN ports or a mix of both.

Each WAN module includes 32 ports, while LAN modules feature 16 ports. Wide-area interfaces include RS-232, V.35, RS-449, EIA-530 and X.21, supporting speeds up to 2M bit/sec.

For WAN applications, the switch establishes straight-through, broadcast and digitally bridged connections at port and group levels. For example, the switch can establish a 1-to-1 connection between data terminal and data communications devices. Alternatively, broadcast links tie one data terminal device to multiple data communications devices, or vice versa.

Digitally bridged connections are designed for multidrop lines that include modems with automatic dial recovery. When one drop on the line is lost and a modem dials back to the data center to reestablish the connection, the Model 2700 will bridge the drop back into the same front-end port to which it was originally con-

(continued on page 15)

Wireless technologies to pave way for private road

By Ellen Messmer
Senior Correspondent

LOS ANGELES — A group of investors building the first major private highway in the U.S. is counting on wireless network technologies to make the road attractive enough for people to pay to use it rather than toll-free alternatives.

The California Private Transportation Co. (CPTC), which has permission from state authorities to build and operate a 10-mile private highway adjacent to the highly congested State Route 91 here, picked a team led by MFS Network Technologies, Inc. to install a radio frequency-based system that monitors passing cars and deducts tolls electronically from their accounts when they pass.

CPTC is betting the $100 million it invested in the highway that drivers will be willing to pay a little extra to travel a road on which there are no toll booths to slow them down.

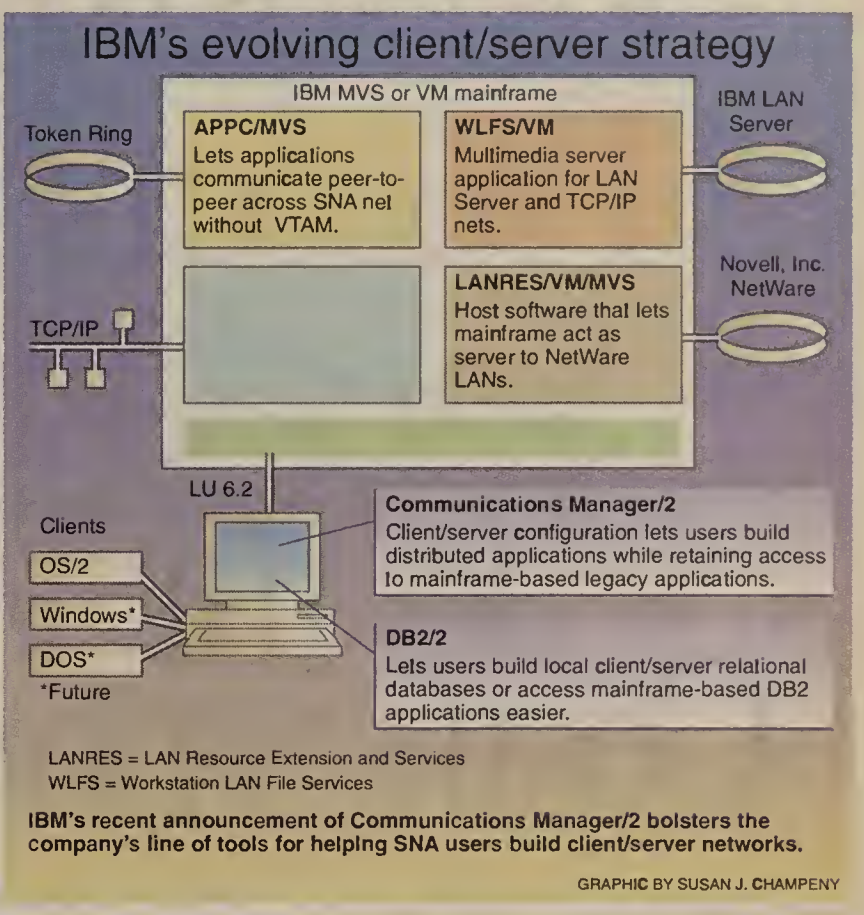
"It could eliminate 30 to 40 minutes on the 10-mile stretch," said Kevin Moersch, president of MFS Network Technologies. About 250,000 vehicles per day travel the stretch during the peak rush hour, which extends from 4:30 a.m. to 9 a.m., he noted.

"We believe this is the best way to serve our customers," said Jerald Pfeffer, managing director of CPTC. "This will assure motorists they can operate at normal highway speeds and not have to slow down for tolls."

The state of California, which currently cannot afford to construct new roads, passed legislation allowing private ownership of highways. CPTC has won a 35-year franchise to build the new express lane in the Los Angeles area. Moersch said the new highway will be the first all-electronic toll road in the country.

The new highway's Electronic

(continued on page 15)



IBM's recent announcement of Communications Manager/2 bolsters the company's line of tools for helping SNA users build client/server networks.

GRAPHIC BY SUSAN J. CHAMPENY

IBM software fights for SNA following

Communications Manager/2 promises better SNA integration but faces fierce competition.

By Michael Cooney
Senior Editor

WASHINGTON, D.C. — IBM's recently introduced OS/2-based Communications Manager/2 promises to make it less expensive and troublesome for SNA users to tie LANs into enterprise nets, but the product must overcome some stiff competition and OS/2's own jaded past.

The new client/server version of Communications Manager/2 is better suited to function as a Systems Network Architecture gateway because it runs on an OS/2 server that can support non-OS/2 clients via a Network Basic I/O System interface ("IBM preps its OS/2 for client/server," *NW*, Feb. 1). As an SNA gateway, the previous version of Communications Manager worked only with OS/2 machines.

But Communications Manager/2 faces competition from SNA gateways such as Novell, Inc.'s NetWare for SAA and the jointly developed Digital Communications Associates, Inc./Microsoft Corp. Communications Server.

"IBM's going to have to convince users that it is serious about this venture and give some solid reasons for them to consider IBM client/server products," said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass. "We don't come across many users employing Communications Manager, so IBM still has a lot to prove there.

"If I have a large enterprise network with many Novell NetWare LANs, why should I look at Communications Manager/2 as the gateway into the SNA enterprise over NetWare for SAA?" Hyland asked. "NetWare for SAA is a solid product, and OS/2's history hasn't been that good."

"IBM's going to have to convince users that it is serious about this venture."

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According to IBM, however, Communications Manager is well positioned for this battle.

"Because we use a NETBIOS pipe between the Communica-

(continued on page 15)

Here's How Our Token Ring Products Stack Up To The Competition's.

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Worth Noting

"Unix, under Novell's control, is far more important than Unix as a stepchild of AT&T. While Novell will not be able to eliminate the proprietary extensions . . . [of] Unix, its control of the software and marketing of UnixWare . . . will give Unix its strongest voice ever."

Technology research report
Bear, Stearns & Co.
New York

Netnotes

NetManage, Inc. of Cupertino, Calif., last week began shipping the latest release of its Chameleon product line that now includes NetControl, a new feature that allows centralized management and distribution of Chameleon Transmission Control Protocol/Internet Protocol software products.

With NetControl, administrators can keep a master copy of both Chameleon 3.1 and ChameleonNFS 3.1 on a central file server, then remotely install them on any user's personal computer over the local-area network. This will let the administrator maintain configuration information on a central server and protect configuration information from being changed without authorization.

NetManage's Chameleon line is a suite of TCP/IP connectivity tools. Chameleon 3.1 and ChameleonNFS 3.1 — with the new NetControl feature — are available now for $400 and $495, respectively.

Folio releases LAN version of document mgmt. pack

Offers simultaneous, multiuser editing capabilities.

By Joanne Cummings
Senior Writer

OREM, Utah — Folio Corp. last week unveiled a local-area network version of its document management and publishing software.

The software enables users to import and index any type of word processing, text, image or graphical information into a common format that can be viewed, shared and searched. It will now offer multiuser simultaneous editing across the LAN and the ability to tag documents with personal notes.

The client portion of Folio Views 3.0 can run on any Apple Computer, Inc. Macintosh, Microsoft Corp. Windows or DOS machine and enables users to view and edit Folio-formatted documents called infobases. Later versions will also support Windows NT and Unix clients, according to Curt Allen, vice president of marketing at Folio.

The server portion acts as a database engine for any LAN that users access to build and store infobases and perform searches.

Version 3.0 includes more formatting options for better screen display and printing, as well as the ability for the same infobase to be viewed and edited by users on different platforms, such as Macintoshes and personal computers, as long as they are linked to the same server.

Version 3.0 also offers real-time indexing and multiuser editing. As soon as a document or other element is entered into the format, every word is indexed and searchable.

Infobases can be edited by as many as 255 concurrent users on a paragraph-by-paragraph basis, enabling coworkers to collaborate on a report, for example, in real time.

In addition, users can now append an infobase with their own personal notations, which can then be stored separately — either locally or on the server — or can be appended to the original document. Notes are fully searchable.

The new version also lets users search for portions of an infobase document using an unlimited number of fields, as well as

(continued on page 12)

Frye delivers new version of NetWare mgmt. pack

By Caryn Gillooly
Senior Editor

BOSTON — Frye Computer Systems, Inc. has released the latest version of its Novell, Inc. NetWare management software that includes new reporting capabilities and other features that give administrators more network control.

Frye Utilities for Networks — NetWare Management 1.5 now provides historical, security and accounting reports, as well as enhanced configuration and disk utilization reports. The new version will also let administrators see which users are logged onto the net and what files they are accessing.

According to Frye, based here, Version 1.5 of its server-based software includes new historical reporting features that let the NetWare 3.11 administrator create graphical output or save to a database statistics on server utilization, connections in use, disk I/Os pending, open files and "dirty" cache buffers, which contain data not yet written to disk. Such information, which was previously available only in real time, helps users track trends and plan changes.

Other new features

New security and accounting features let administrators check user passwords and security levels for each directory, as well as report on connect-time charges, disk storage charges and log-in/log-out times.

NetWare Management 1.5 also includes new configuration reporting capabilities — such as printer, queue and node configuration — as well as disk utiliza-

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"The price of installing wireless equipment is offset by the cost of pulling new wire."

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Dan Smith
Senior vice president of information systems
Younkers, Inc.

Wireless LANs fit the bill for retailer's net

Younkers to spend $1 million outfitting over 50 stores with NCR WaveLAN in POS net upgrade.

By Fredric Paul
Senior Editor

DES MOINES, Iowa — Younkers, Inc., a chain of 54 department stores in seven Midwestern states, has signed an agreement that appears to make it the first major retail operation to use wireless technology for linking all of its point-of-sale terminals at all of its stores.

Younkers is leasing more than $1 million worth of NCR Corp. WaveLAN wireless local-area network equipment, which it will use in all its stores to build LANs supporting POS terminals. The wireless LAN equipment promises to help speed installation of the POS system, increase flexibility to respond to customer needs and eliminate the cost of wiring and rewiring, according to Dan Smith, Younkers' senior vice president of information systems.

While sores such as JCPenney's and Mervyn's have used wireless in limited applications, Younkers is apparently the first to fully embrace the technology.

Using spread-spectrum radio technology and data transfer rates of up to 2M bit/sec, the NCR WaveLAN adapter cards will link 386SX-based NCR 7052 POS terminals to any one of as many as six WaveLAN receiving units per store. These receivers — basically personal computers with WaveLAN cards — are located in a back room or, if needed to overcome interference, on the store floor. The receiver is wired to a 486DX/2-powered NCR 3350 In-Store Processor workstation.

Local POS and database applications supplied by Post Software International, Inc. of Wake Forest, N.C., will run on both the POS terminals and the OS/2-based server. In addition, the store networks are connected via leased 56K bit/sec lines to Younkers' IBM 3090 mainframe at its headquarters here. The mainframe handles such applications as credit authorizations, merchandise location and account number lookups.

While chains have used wireless in limited applications, Younkers is apparently the first to fully embrace the technology.

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The firm wanted to replace its POS system after it acquired the 25-store H.C. Prange Co. retail chain last year, Smith said.

"We took a short, hard look," he said, adding that the company went with WaveLAN because it was the only system that was fast enough, could work around obstructions and could handle the required number of terminals per store. WaveLAN also had a substantial installed base in retail environments.

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Folio releases LAN document mgmt.

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utilize a document's table of contents to perform hypertext-type searches through large documents.

It also supports multimedia objects, such as audio or video clips, enabling them to be linked with infobase documents using Windows' Object Linking and Embedding client interface. Folio also offers its own object handler interface that supports other types of clients.

Each infobase can contain as many as 16T bytes of information, and in Version 3.0, new edits to an infobase document are made through a sequentially committed transaction. Thus, if the server goes down, the database can roll back to the last saved changes, maintaining the integrity of the document.

Folio Views 3.0 will be available at the end of the first quarter for $495 per user. Folio Views Lite 3.0, which is client software that provides only view, search and personal annotation capability, costs $195 per user.

Wireless LANs fit the bill for retailer's net

continued from page 11

The terminal portion of WaveLAN, which costs $695, including DOS drivers, consists of a PC expansion card and an external omnidirectional antenna housed in a 3-in. square case. It is compatible with Novell, Inc.'s NetWare 2.X, 3.1X and NetWare Lite, IBM's LAN Server and LAN Manager and Microsoft Corp.'s Windows for Workgroups. WaveLAN can support any number of PCs within a 1,000-ft-radius.

Using spread-spectrum technology, WaveLAN signals travel over a range of radio frequencies between 902 MHz and 928 MHz, making it difficult to intercept or interfere with the transmission. Transmission is blocked only by thick concrete or metal.

For Younkers, installing the wireless network added no extra costs in comparison to a new wired system and may have saved the firm money. "The price of installing wireless equipment is offset by the cost of pulling new wire," Smith said, estimating the cost of wiring at $350 to $400 per terminal. "We had very old wire voice-grade stuff that doesn't work very well for LAN applications."

The cost of pulling new wire throughout all the stores would have been "at best a break-even" proposition compared to using wireless cards. If workers encountered additional problems, such as asbestos, pulling new wire "could get really expensive," he added.

By choosing wireless technology, the firm will begin installation at the first store in early March. Smith expects the entire project to be completed by the end of July. "I get the functionality a lot quicker" because there is no wait for technicians to pull the wire.

Quick installation was an important consideration because Younkers plans to use the LAN to support key functions with high payback potential, such as a price/lookup system that lets salespeople query the database to locate the price of any item in the store. "The sooner we get it into the stores, the sooner we can start the payback," Smith said.

The wireless LAN also offers more flexibility. "Customer service is a lot better when I can move the mountains to Muhammad," he added. "I can move registers to the linen department now, then to the shoe department next week [to keep up with various sales]. Customers don't have to walk to faraway registers. And I don't have to buy 10% more registers than I need."

The company calculated that the new system had to generate just $15,000 to $20,000 additional income per store in sales to pay for itself. "Percentage-wise," Smith said, "that's very small. It was a no-brainer that I would be able to increase the business by that amount."

Frye delivers new NetWare mgmt. pack

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tion information.

Finally, the new version lets the administrator display names of users accessing any given file, in addition to how many have opened the file to read or write to it. Version 1.5 also lets the administrator see all nodes attached to or logged into a particular file server, all of which aids in configuration planning.

Frye Utilities for Networks — NetWare Management 1.5 is available now for $495. Current NetWare Management users can upgrade to Version 1.5 for $200 per server license. According to Frye, users that upgrade will receive free Frye Utilities for Networks — Node Tracker, software that provides automatic node mapping, point-to-point testing and other options.

Worth Noting

Nearly 80% of the Fortune 500 users are interested in collapsing their SNA traffic onto a LAN internet backbone, according to a Salomon Brothers, Inc. survey. But only 40% of those users feel that the solutions available today are sufficiently robust to begin a wide-scale migration.

Link Notes

Cisco Systems, Inc. last week announced that its routers have tested successfully as being compliant with the Government Open Systems Interconnection Profile (GOSIP) Version 2, paving the way for the company to more aggressively target the federal market, where the purchase of OSI products has now become a requirement.

Testing of the Cisco routers was conducted last month at Alcatel TITN, a National Institute of Standards and Technology (NIST)-accredited GOSIP test laboratory. Formal certification and listing on the GOSIP register of approved products is pending.

Wellfleet Communications, Inc. last month also announced plans to have its OSI routers certified for conformance under NIST guidelines ("Wellfleet preps OSI router, high-speed HSSI interface," *NW,* Jan. 11).

IBM announced at ComNet '93 in Washington, D.C. last week that its 6611 Network Processor router has met all Internetwork Packet Exchange(a) Router specifications set by Novell, Inc.'s NetWare(a) Tested and Approved

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Cayman offers 24-hour service/support program

Vendor guarantees response within one hour.

By Maureen Molloy
Senior Writer

CAMBRIDGE, Mass. — To address the growing user demand for better service and support, Cayman Systems, Inc. last week announced an around-the-clock technical support service.

With the new 7 by 24 Support Plan, users are guaranteed access to Cayman technical support personnel 24 hours a day, 365 days a year. The company said it will guarantee that requests will be acted upon within an hour and technical support representatives will stay on the problem until it is resolved.

The program includes support for Cayman's GatorBox EX Ethernet-to-Ethernet router, GatorBox CS and GatorStart GX LocalTalk-to-Ethernet routers, as well as GatorLink — the company's AppleTalk Remote Access Protocol server — and XGator, its X Window System client for the Apple Computer, Inc. Macintosh.

Pricing is set on a per-account basis, depending on the size of the customer's net and the number of Cayman products on it.

In a related announcement, Cayman said it is enhancing its software maintenance plan to provide subscribers of its GatorCare program with two additional benefits.

Under the terms of the improved maintenance plan, subscribers will receive priority assistance from Cayman's Technical Support department, ensuring that calls will be transferred directly to a support representative or be placed at the top of the support queue. The second benefit includes an overnight hardware replacement guarantee in the event that a unit malfunctions.

GatorCare subscribers will continue to receive automatic delivery of all software upgrades that become available during the term of their contracts.

The GatorCare annual maintenance plan costs $349 per hardware unit for the GatorBox EX, $299 for the GatorBox CS and GatorStar GX, and $129 for GatorLink. Volume discounts are also available.

Customers that buy the GatorCare package at the time of the original hardware purchase may obtain it at a discounted cost of $249 for the GatorBox EX, $199 for the GatorBox CS and GatorStar GX, and $99 for GatorLink.

For more information, contact Cayman at (617) 494-1999.

Rockwell unit introduces dial-up NetHopper router

SANTA BARBARA, Calif. — The CMC Network Products division of Rockwell International Corp. last week announced at ComNet '93 a dial-up router that supports wide-area analog links at speeds up to 56K bit/sec.

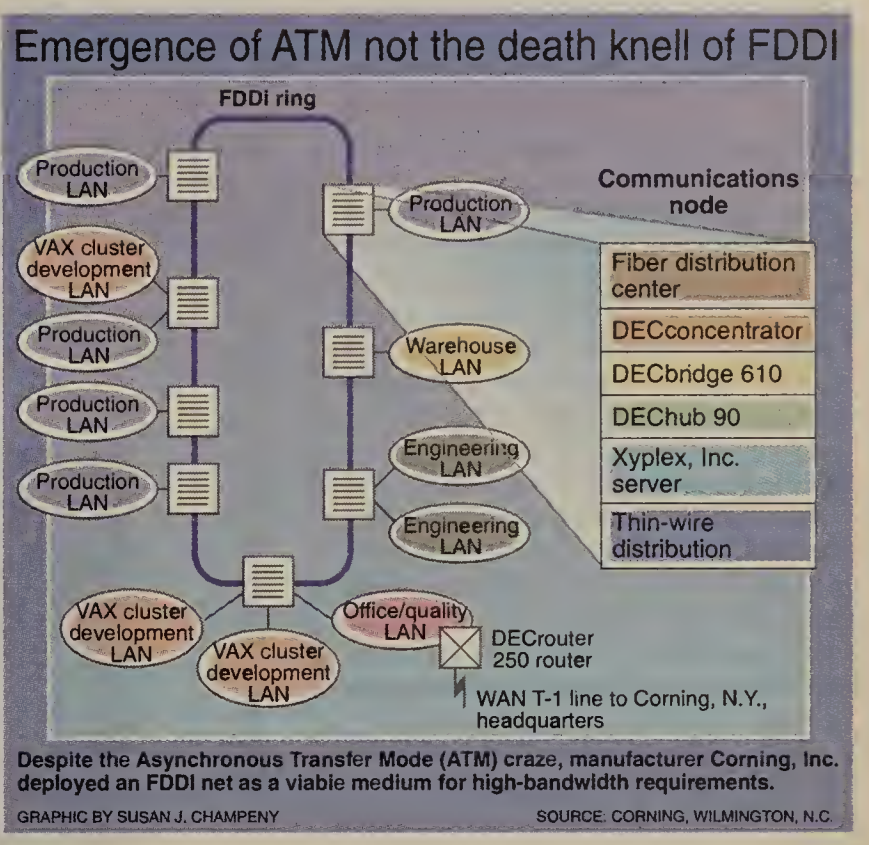
The NetHopper routes Ethernet-based Transmission Control Protocol/Internet Protocol traffic and comes equipped with its own integrated modem.

The use of dial-up facilities to create links on an as-needed basis represents an alternative for sites that cannot cost-justify leased lines. And unlike terminal-emulation devices that link a terminal to a remote host, the router offers bidirectional connections and better net security, addressing a concern for users that utilize the public telephone net to transmit data.

The NetHopper comes equipped with an integrated V.32 modem and V.42bis data compression and is available in two configurations. The NH-1 has one modem and one Ethernet port and costs $1,995. The NH-3, which has three modem ports and a single Ethernet interface, is aimed at branch sites that require more than one wide-area link. It is priced at $3,495.

Both models are equipped with a Simple Network Management Protocol agent and can be managed from any third-party SNMP-based net management system.

For more information, contact Rockwell at (805) 562-3114.



Despite the Asynchronous Transfer Mode (ATM) craze, manufacturer Corning, Inc. deployed an FDDI net as a viable medium for high-bandwidth requirements.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: CORNING, WILMINGTON, N.C.

Corning dumps E-net for FDDI solution

Fiber provides manufacturer with solid foothold in market today and easy path to ATM tomorrow.

By Maureen Molloy
Senior Writer

WILMINGTON, N.C. — Corning, Inc. has just completed installation of the final phase of a buildingwide FDDI internet that supports everything from business systems to shop floor production at a manufacturing plant here.

In an effort to accommodate a spate of new users and bandwidth-hungry applications, the consumer and communications products giant embarked on a year-long migration from an Ethernet backbone to a Fiber Distributed Data Interface-based net supporting Ethernet departmental subnets.

According to Regis Serene, Corning's senior network engineer, the old backbone consisted of two Ethernet local-area networks — one supporting office/administrative users and another supporting manufacturing — which were linked via a Digital Equipment Corp. LANBridge 150 bridge.

Both nets were buckling under near-gridlock conditions as new users were added. In addition, with more development work taking place at the facility, Serene found that test applications were hogging valuable LAN bandwidth, leading to high data collision rates and dropped packets.

Furthermore, several of the DEC VAXes on the office Ethernet LAN were servicing users on the production Ethernet, and vice versa, saturating the bridge.

These conditions resulted in an unreliable network that was often brought to a virtual standstill during peak traffic periods. "Our original topology had become a serious hindrance to growth," Serene said. "In order to handle increasing production, customer and quality demands, we needed better network segmentation, more bandwidth and a consistently reliable net."

During the initial redesign, Serene considered several net technologies, including FDDI, fast Ethernet and Asynchronous Transfer Mode (ATM). He opted for FDDI because he considered it the most sound and entrenched medium at the time.

"FDDI today is a solid and standard technology; ATM and fast Ethernet are not," he said. "FDDI answered our immediate requirements and positioned us for the advance of ATM."

Serene said he does not agree with industry observations that FDDI will be leapfrogged by ATM. ATM will only surpass FDDI in shops that have yet to incorpor-

(continued on page 14)

Corning dumps E-net for FDDI solution

continued from page 13

ate FDDI and have the luxury to wait for ATM, he added.

"We may have waited for ATM if it were further along in development when we made our decision [last winter]," Serene said. "But we had immediate bandwidth requirements and felt that ATM was not an option for us at the time."

He expects future multimedia applications to drive his firm's migration to ATM since a shared net such as FDDI is ill-suited for the task. He also foresees ATM obviating the development of FDDI-2, an emerging ANSI specification designed to handle voice, video and data simultaneously.

Building a better highway

The FDDI backbone consists of nodes that house a DECconcentrator, a DECbridge 610, one or more DEChub 90 intelligent hubs and a Xyplex, Inc. terminal server, as well as wire and fiber distribution components (see graphic, page 13).

Departmental LAN workstations are wired via copper to eight-slot DEChub 90s, which are filled with repeater cards and a bridge module. All local traffic stays within the hub and can be bridged from one logical LAN to another, while data intended for remote destinations is passed to the DECbridge 610 in order to get onto the FDDI backbone.

The DECbridge 610s are linked to the backbone via the DECconcentrator. Serene said he chose not to put the DECbridges directly on the ring because it would disrupt communications on the ring any time a new bridge was required.

The Xyplex servers are used predominantly for asynchronous terminal server connections to a host VAX.

The hub, server and bridge are attached to the thin-wire distribution panel so that thin-wire segments can be attached or detached without disrupting the network.

In order to link users on the net to corporate headquarters in Corning, N.Y., two DECrouter 250 routers were installed to transmit data to the central site via T-1 facilities.

According to Serene, virtually all network traffic traversing the FDDI backbone is LAN to LAN. Almost 90% of the traffic is from personal computers and Apple Computer, Inc. Macintoshes to VAX clusters, while the remainder is terminal-to-host and PC-to-PC communications.

In addition to providing the much needed boost in bandwidth, Serene said the new FDDI backbone has enabled Corning to segment its network traffic into controllable, manageable LANs by splitting traffic into multiple office, administrative, production and engineering domains.

Link Notes

continued from page 13

program, which determines whether a product is compatible with the NetWare operating system and other Novell products.

IBM also announced two new software releases for the 6611. Release 1.1, available now, provides additional protocol support for AppleTalk 2 as well as transparent bridging on Ethernet local-area networks. Release 1.2, which will be available next month, will provide Advanced Peer-to-Peer Networking (APPN) Network Node support, enabling the 6611 to act as the server for token-ring clients equipped with APPN End Node or Low Entry Networking support. Both releases will be available as a free software upgrade.

LANNET Data Communications, Inc. and **Data General Corp.** last week signed a strategic partnership agreement whereby DG will provide on-site service for LANNET intelligent hub users. Under the terms of the deal, DG's more than 550 account engineers at more than 200 service locations will act as LANNET's national on-site service provider. For details, contact LANNET at (714) 891-5580.

Network Application Technology, Inc. (NAT) has dropped the price on its line of remote bridges and routers. The NAT Remote Bridge LANB/200 costs $1,995 — down $150 — while the LANB/290 Remote Internet Protocol Router was reduced by $300 to $2,695. These price cuts are effective immediately.

Wellfleet Communications, Inc. last week announced it has added Banyan Systems, Inc.'s VINES Internet Protocol to the protocols supported by its routers. As part of the VINES enhancement, Wellfleet will offer a new Serverless Network Segment capability designed to overcome the single-hop limitation imposed by the VINES protocol, enabling users to expand their VINES nets beyond their usual scope.

The protocol will be available in the second quarter as a free software upgrade.

Telenex switch adds flexibility, cuts costs

continued from page 9

nected, thus restoring the mainframe session. "It operates just like it did in normal mode," said Sam Mahaffey, vice president of Telenex.

LAN connections, meanwhile, can be established as straight-through links, extensions of external rings or variable rings created within the switch.

Variable rings allow users to attach workstations, servers and printers in virtual token-ring LANs without MACs, Mahaffey said. Users can attach workstations to the Model 2700 and then assign specific workstations to a ring with specific servers and printers, he said.

Virtual LAN connections through a matrix switch have particular benefits over switching hubs, according to Mahaffey.

"Switching hubs typically have a backplane that will support four, eight or some finite number of rings," he said. "In this case, it's as many rings as you define because the switching architecture is not backplane-limited."

The variable-ring capability can also be used to extend existing LANs by forging connections from LANs to bridges, routers and servers that are not physically connected to those LANs. In this fashion, those resources can be shared by many LANs.

For example, users can back up files from multiple rings to one file server instead of dedicating a file server to each ring. Also, a small number of bridges and routers can be used as backups for many attached rings.

The Model 2700 is available now and is priced from $300 to $350 per port.

IBM software fights for SNA following

continued from page 9

tions Server/2 server and the downstream clients, rather than the Named Pipes connection the [DCA] Communications Server uses, we can pump data three to five times faster," said Bob Roth, manager of the IBM-Novell relationship with IBM's Networking Systems division.

Analysts also noted that Communications Manager/2 will have better Advanced Peer-to-Peer Networking and NetView support than the DCA and NetWare for SAA products. Eliminating the requirement to put OS/2 on every node will also be a plus.

"The Communications Manager/2 announcement clearly puts IBM in a good position to battle in a fray where they have been positioned badly in the past," said Nancy Meachim, a senior analyst with International Data Corp., a market research firm in Framingham, Mass. "IBM needed to show users a positive direction, and [its recent] announcements do that."

Users seem split on IBM's Communications Manager/2 announcement.

"If you've got memory constraints on your client machines, then I can see where [the new client/server version of Communications Manager] would help, but we don't have that problem, so it's of limited interest to us," said Marty Wiltse, director of audit on information systems for the Kansas Turnpike Authority.

"IBM has demonstrated, at least to us, that it's serious about developing client/server technology," said Dennis Vilela, assistant to the vice president of manufacturing and marketing for Texaco Latin America/West Africa, a division of Texaco, Inc. "IBM has done a lot of tailoring of its OS/2 and AIX products for us, and we think it will help us grow and compete more efficiently."

Wireless to pave way for private road

continued from page 9

Toll and Traffic Management System will require commuters to set up accounts and receive a credit card-sized transponder to mount on their rearview mirror.

Small antennas on the roadside will send out signals in the 915-MHz range. As a vehicle passes an antenna, the car's transponder will pick up the signal and return it, allowing a networked system of databases to record the vehicle's presence and subtract the toll electronically from the owner's account.

The automatic vehicle identification equipment will be provided by Texas Instruments Radio Identification Systems, Inc.

A series of video cameras along the highway will record passing traffic on a 24-hour basis. That video data will be sent to a data center by means of a high-speed fiber-optic T-3 network built by MFS Network Technologies and stored for review and accumulation of statistics. Drivers who try to dodge toll collection will not go unnoticed since their license plate numbers will be recorded on camera, Moersch said.

The new road should be paved and open by 1995.

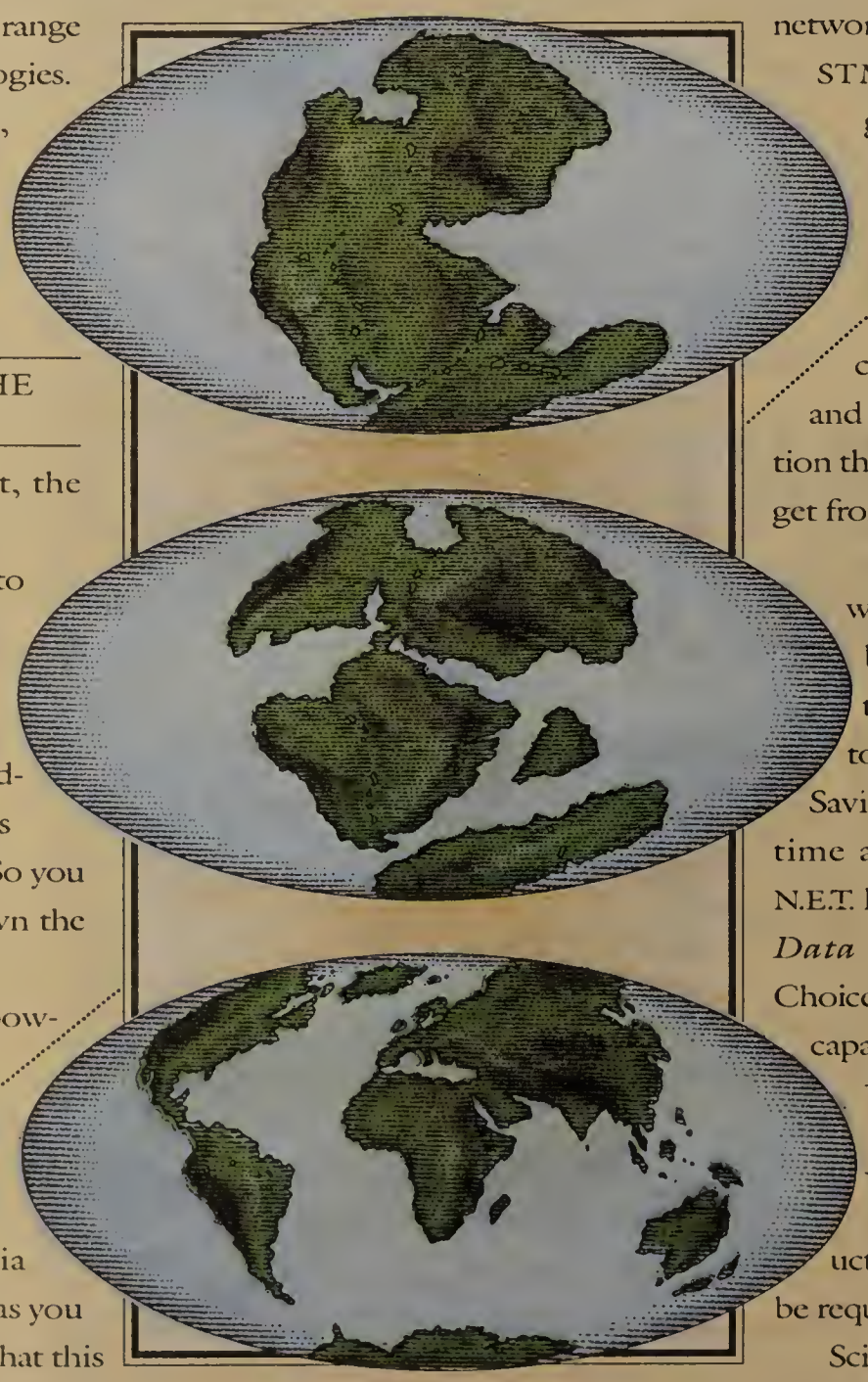
Not long ago, identical fossil types were discovered in South America and Africa. A rather curious unearthing, given that the two continents are noted today for their uniquely different species. To explain this finding, the naturalist Alfred Wegener correctly proposed the idea that long before our knuckle dragging ancestors made their foray onto the planet, Earth's continents had once been a single land mass that later split apart. What we are referring to, of course, is the theory of continental drift.

While many set out to change the world, the real movers and shakers are the tectonic plates.

Although this most fantastic of Earth's mysteries may cause alarm for some people, it doesn't trouble us in the least. Because no matter how far apart the continents may drift, N.E.T.'s enterprise networks will make certain that they all stay connected. Easily, quickly and transparently.

200 Million Years Ago Earth's Continents Started Drifting Apart. Today, We're Working To Bring Them Back Together.

N.E.T. offers the world's widest range of networking products and technologies. Going beyond wide area networking, effectively linking local and wide area networks. And we have more ways to simplify network management, if you get our drift.



OUR PLAN TO REUNITE THE CONTINENTS.

When it comes to movement, the Earth takes its sweet time.

We, on the other hand, prefer to move at a more rapid pace. Take our new Asynchronous Transfer Mode (ATM) product, for example. Developed through our ADAPTIVE subsidiary, ATMX tears down the barriers that exist between LANs and WANs. So you can connect desktop to desktop, down the hall and around the world.

Furthermore, it gives you the power to connect high performance workgroup data networks today and the ability to add multimedia applications as you need them. That this technological accomplishment originates from N.E.T. should come as no surprise. After all, ATMX has an impressive genealogy. From the broadband, high speed networks of our STM, to the global communication capabilities of IDNX, to the internetworking capabilities of our enterprise routers and frame relay modules. Not to mention the access networking capabilities you get from our ADNX and SPX products.

We're tearing down the boundaries between LANs and WANs. Now you can connect desktop to desktop down the hall, and around the globe.

Millions of years ago, the continents were in a single mass called Pangaea. It eventually split and formed two smaller masses, Gondwanaland and Laurasia. Further splitting brought the continents to their present position. And you thought people had a hard time staying together.

By choosing N.E.T. as your networking partner, you get an incredible range of flexible networking solutions that can meet your objectives today and carry you into the future. Saving you a tremendous amount of time and money. Perhaps that is why N.E.T. has just swept the prestigious *Data Communications* User's Choice awards for outstanding technical capability and support.

WHAT GOES AROUND COMES AROUND.

It seems that networking products bridging great distances may not be required 250 million years from now.

Scientists tell us that if present movements continue, the Atlantic and Indian Oceans will close up, drawing the continents together in a single immense land mass. Fascinating. But frankly, who can wait that long?

NET
Network Equipment Technologies

Don't let opportunity drift by. Call 1-800-388-4NET for more information.

Worth Noting

"Your average outsourcing agreement has more to do with financial engineering than network engineering."

Patrick Springer
Director of communications consulting
Computer Tass Group
Waltham, Mass.

Regulatory Update

MCI Communications Corp. blasted **AT&T** last week, accusing it of attempting to offer an illegal off-tariff deal to Long John Silvers. Late last month, AT&T filed a Tariff 15 discount offer for Software-Defined Network and 800 services for the restaurant chain, claiming that it was responding to an off-tariff deal offered by MCI.

Last week, MCI claimed the Tariff 15 deal was illegal on two counts. First, since the deal includes 800 service, MCI claims the offer violates a Federal Communications Commission order from April of last year, which banned the bundling of new 800 service into custom deals until 800 portability arrives.

Second, MCI pointed to an FCC order from September 1991, concluding that the first existing Tariff 15 deal was illegal. That order applies to all Tariff 15 deals, from those currently on the books to future deals, MCI claims. A morass of legal wrangling has prevented the FCC from enforcing this, MCI said.

MCI also complained that AT&T miscalculated the rates it was offering to Long John Silvers, resulting in discount rates that were greater than those included in the deal. Because of this, AT&T's rates are actually lower than MCI's rates — a situation not permitted under Tariff 15.

AT&T gaining ground in battle against toll fraud

Says NetProtect has helped cut losses by 75%.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week reported what it says is major progress in its efforts to help its business customers protect themselves against toll fraud.

Since it began offering a family of toll fraud monitoring services last August, AT&T said it has thrown more than 1,000 alleged hackers off its 800 network and has notified roughly 1,000 customers per month of calling patterns that could be caused by toll fraud.

The carrier would not divulge what the average toll fraud loss is but said it has plummeted by 75%. AT&T said toll fraud costs carriers and users about $2 billion a year.

In May, AT&T rolled out NetProtect — a family of toll fraud services that includes net monitoring, consulting and educational services designed to help users detect fraud ("AT&T matches Sprint toll fraud protection services," *NW,* May 18, 1992).

Currently, AT&T technicians use computers to scan 800 services and international call records for patterns that might indicate toll fraud, such as heavy after-hours calling and numerous calls to other countries.

"Of course, we only look at patterns," said Dominick Tolli, AT&T's NetProtect manager. "Only the customer knows if the calls are authorized."

AT&T is working with AT&T Bell Laboratories to develop software that will enable the carrier to better identify patterns that suggest toll fraud, Tolli said.

When a suspicious pattern is discovered, AT&T representatives call the customer and advise ways to secure equipment, such as private branch exchanges and voice messaging systems.

The carrier has also held toll fraud prevention seminars for more than 22,000 customers. AT&T tells users to limit remote access to PBXs, establish long passwords and change them frequently, and program telephone systems to block calls to certain area codes and foreign countries.

The carrier has also held seminars for police officers and court personnel, and has worked with legislators to toughen laws against toll fraud, Tolli said.

Users not jumping gun on cellular phone, cancer link

By Wayne Eckerson and Ellen Messmer
Network World Staff

ST. PETERSBURG, Fla. — Charges by a man here that chronic use of cellular telephones can cause brain cancer have not alarmed network managers, although most would like to see conclusive tests about the safety of cellular transmissions.

David Reynard recently filed a lawsuit at the Pinellas County courthouse charging that a brain tumor, which killed his wife, was caused or aggravated by radiation emitted by her NEC Corp. cellular car telephone.

Public fears raised by the lawsuit prompted Congress and the Federal Communications Commission last week to take a closer look at the issue, with the FCC indicating it will probably adopt lower radiation-level guidelines, which would lead to a reevaluation of cellular equipment.

While there is evidence that high-powered microwave transmission can cause heat damage to the body and cataracts, cellular phones operate at much lower frequencies and power levels. There are few scientific studies, however, to determine if cellular phones cause heat damage or alter cell structures in humans.

An NEC spokesperson said the firm's portable phones run in the cellular frequency band (800 MHz to 900 MHz) and have a maximum power outage of .6 watts, well within ANSI guidelines for cellular radio transmissions. The source noted NEC's mobile car phones output 3 watts of power, but the antennas are on car roofs,

(continued on page 18)

MCI offers 2 generic custom net deals

Option 1		
Term	1 year	
Service	Virtual Network (Vnet)	
Minimum volume	10,000 minutes per month to Atlantic, Pacific and Indian Ocean locations or specific minutes of usage to 40 countries	
Rates	Vnet	18.3% discount
	International calls	Typical tariffed rates
	7-digit dialing plan	$25,000 for installation plus $10,000 per month
	All other rates	From MCI's existing general tariffs

Option 2				
Term	1 to 5 years			
Service	Dedicated and switched services			
Minimum volume	Negotiable			
Rates - From MCI's general tariffs except for volume discount to be applied				
Maximum volume discount - switched services				
Monthly charges		**Vnet**	**Other**	
$50,000-$74,999		2%	1%	
$75,000-$99,999		4%	5%	
$100,000-$249,999*		5.5%	9%	
$250,000-$499,999*		7.5%	10%	
$500,000-$999,999		9.5%	11%	
$1 million		11%	13%	
Volume discount - dedicated services				
Monthly charges	**DS0**	**DDS**	**T-1**	**T-3**
$50,000-$249,999	7%	21%	37%	16%
$250,00-$499,999	10%	28%	48%	23%
$500,000-$999,999	10%	30%	49%	35%
$1 million	10%	31%	51%	36%

*Depending on computation of discounts already specified in MCI's general tariffs

SOURCE: MCI COMMUNICATIONS CORP., WASHINGTON, D.C.

MCI's filing sheds light on custom deals

First court-ordered tariff filing gives users generic picture of custom plans but few specific details.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — For the first time ever, MCI Communications Corp. last week filed a tariff revealing details on services, pricing, discounts and special options for its custom network deals.

MCI was forced to file the tariff last week in response to an order from the U.S. Court of Appeals for the District of Columbia that found the Federal Communications Commission's rules exempting nondominant carriers from filing tariffs to be illegal. That order was issued in November but did not take effect until last week, when the FCC lost its quest to get the appeals court to rehear the case.

Although MCI was the first to act, attorneys said every long-distance carrier — and possibly every reseller and alternative access provider — must now file tariffs for all services.

Last week, Sprint Corp. and other carriers had not yet filed tariffs but said they were evaluating how to proceed.

A spokesman for Sprint said the carrier "will file something shortly with the FCC to ensure compliance with the court's ruling."

If carriers fail to file tariffs, competitors could take them to court for damages. AT&T already went to the FCC seeking damages for MCI's use of off-tariff deals over the last three years. The FCC has not yet decided how to proceed on the issue of damages.

For better or worse

It is unclear whether users will benefit or suffer from the public exposure of every carrier's deals. Some customers have complained that filing tariffs for custom deals could divulge proprietary or competitively sensitive information about their networks.

Others have said a public airing of carriers' previously secret deals will give users a better market barometer and help them drive harder bargains.

But those hoping the tariffs will give them greater insight into carriers' custom deals may be disappointed if all of the new filings look like MCI's tariff.

MCI filed two broad, generic options and provided no information on individual arrangements that have been struck with customers.

MCI's tariff for custom networks, which it calls special customer arrangements (SCA), was added as a new section to the tar-

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MCI's filing sheds light on custom deals

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iff MCI already had on file for its general service offerings.

The SCA tariff contains much less information than AT&T's Tariff 12 custom network filings, which MCI and others previously complained were too sketchy.

The SCA tariff lists only two options. The first option, a nonrenewable, one-year deal, is for MCI's Virtual Network (Vnet) service. MCI will offer an 18.3% discount on Vnet, but customers benefiting from the arrangement are not eligible for additional volume discounts.

In addition, customers pay MCI's standard tariff rates for outbound international switched voice service, its Vnet card and Vnet Global Reach.

Users generating a specific amount of traffic each month to 40 carrier-specified countries will be offered general tariffed rates, while SCA customers placing ship-to-shore calls to international locations via the International Maritime Satellite Organization will be offered a special rate of $6.70 per minute.

For customers that want a seven-digit dialing plan on their network, MCI will charge $25,000 for installation and $10,000 per month.

MCI's second SCA option is broader; the deal can be struck for one to five years, is renewable and includes both switched and dedicated services. Minimum volume requirements are mutually agreed upon by the customer and MCI.

Rates under Option 2 are based on MCI's tariffed offerings, but the carrier built in volume discount plans for switched services that range from 1.5% to 11% for Vnet service and 1% to 13% for other services, depending on monthly usage (see graphic, page 17).

MCI is also offering volume discounts on all of its dedicated services. These range from 7% to 10% for DS0 lines, 21% to 31% for digital data service, 37% to 51% for T-1 and 16% to 36% for T-3 lines, again depending on monthly usage.

In addition to specific telecommunications services, MCI's SCA tariff lists a range of other features users can order, though it does not list pricing. The features include special provisioning flexibility, network monitoring, network outage credit provisions and turnkey operations.

Users not jumping gun on cancer link

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not on the phones — which most experts agree does not pose a health hazard.

Reynard and his attorney, John Lloyd, declined to speak to the press. Reynard also refused to provide NEC with discovery information about the claim and medical evidence, according to an NEC spokesperson in Melville, N.Y.

While the charges have caused a public stir, they have not overly concerned *Network World* User Advisory Panel members, many of whom use cellular phones.

"I havn't read the actual brief, but these charges don't seem plausible on scientific grounds," said Kenneth Phillips, counsel to the office of the chairman at Citicorp and chairman of the Committee of Corporate Telecommunications Users, a nonprofit organization that represents 30 of largest telecommunications users before legislative bodies.

Phillips, who also teaches physiological psychology at New York University and has been an expert witness in court cases, said Reynard will have difficulty proving that his wife's cancer was caused by a cellular phone and not genetic or other environmental factors. "This thing seems farfetched," Phillips said. "I would not stop using a cellular phone because of it."

Other advisory board members would like to see more tests performed to ensure there are no safety problems.

Chuck Papageorgiou, network administrator at United Parcel Service, Inc. in Mahwah, N.J., said he is withholding judgment about the safety of cellular phones until he hears from experts who have studied the transmission impact on humans.

The public hysteria triggered by the media coverage of the Reynard lawsuit has motivated Capitol Hill lawmakers to jump on the issue. Last week, Rep. Edward Markey (D-Mass.), chairman of the Subcommittee on Telecommunications and Finance, wrote to Tom Stanley, chief engineer of the Office of Engineering and Technology at the FCC, asking him to inform Congress on the nature of current standards for radio frequency radiation.

Last week, Stanley said the FCC has not independently evaluated the ANSI standard. But he added that the FCC is not the government agency's expert for that job, pointing instead to the Environmental Protection Agency, the Department of Agriculture and the Occupational Safety and Health Administration.

Worth Noting

"The soft costs of supporting electronic mail are much greater than the hard costs [of hardware, software and other equipment]."

Steve Schmiedeskamp
President
Automated Business Solutions, Inc.
Columbia, Mo.

Store & Forward

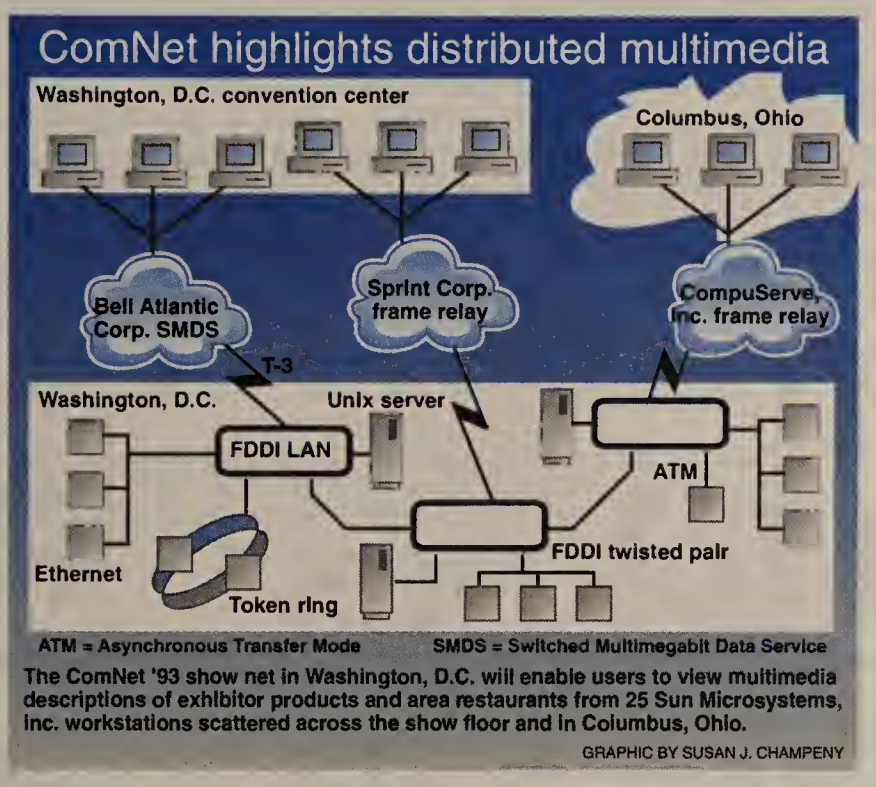
CGI Systems, Inc. of Pearl River, N.Y., last week demonstrated a prototype version of a computer-aided software engineering tool for developing client/server applications. PacBase for Client/Server contains an object-oriented repository that supports version control, change management and event-tracking features.

Andersen Consulting last week announced a new version of Foundation for Cooperative Processing, a computer-aided software engineering tool that lets developers build Windows-based client/server applications.

Available now, Version 2.1 also supports an improved application program interface for moving between OS/2 and Windows client environments, as well as new configuration and security features.

Easel Corp. of Burlington, Mass., last week announced a new object-oriented version of Easel Workbench that makes it easier for Easel developers to create DOS, Windows and OS/2 applications.

The OS/2, Windows and DOS versions cost $10,900, $9,900 and $7,900, respectively.



The ComNet '93 show net in Washington, D.C. will enable users to view multimedia descriptions of exhibitor products and area restaurants from 25 Sun Microsystems, Inc. workstations scattered across the show floor and in Columbus, Ohio.

GRAPHIC BY SUSAN J. CHAMPENY

Conference demo features multimedia application

Vendors employ VNS to showcase technologies.

By Joanne Cummings
Senior Writer

WASHINGTON, D.C. — Attendees of the ComNet '93 show here last week were treated to a unique demonstration of a distributed multimedia application running over a multivendor show network called LiveNet.

The network brought together several high-performance technologies, including Fiber Distributed Data Interface, Switched Multimegabit Data Service, Asynchronous Transfer Mode and frame relay, according to James McArdle, director of LiveNet.

Distributed across the network was an application from Houston-based The ForeFront Group called the Virtual Notebook System (VNS), a client/server program designed to run on a variety of platforms.

"VNS is a good fit with LiveNet," said Andrew Burger, vice president of technology at ForeFront. The conference "needed an application that could demonstrate the utility of the nets but also bring different technologies together. VNS drives the information across the various equipment and shows that it works."

The demo consisted of several Unix machines running the server portion of VNS, linked over various types of nets to 25 Sun Microsystems, Inc. workstations running client software based on the Motif graphical user interface.

ForeFront said the client software can also run on an X Window System terminal, Apple Computer, Inc. Macintosh or Windows-based personal computer. The company is said to be working on a server version of VNS for Microsoft Corp.'s Windows NT.

Each vendor participating in the demonstration provided an audio sound bite, images and descriptive text about its exhibits, which Burger collected and placed in the software's "notebooks," server-resident repositories that allow objects to be searched and linked over the net.

"VNS drives the information across the various equipment and shows that it works."

▲▲▲

Attendees used the workstations to browse through collections of notebooks, called libraries. When they clicked on the icon representing the notebook, they could instantaneously view the images, video clips and text, as well as listen to the audio clips collected there, no matter which server the notebook had been stored on, Burger said. They could also click on icons repre-

(continued on page 20)

New apps system takes center stage

By consolidating databases with Artsoft, Kennedy Center gains speed and efficiency in ticketing.

By Timothy O'Brien
West Coast Bureau Chief

WASHINGTON, D.C. — When it comes to mission-critical applications, the John F. Kennedy Performing Arts Center in Washington, D.C. considers its Sybase, Inc. SQL Server-based box office system essential for the curtain to go up.

During the past few months, the Kennedy Center has completed implementation of an integrated set of SQL Server-based applications, including Box Office, Fund Raising, Subscription and Patron modules from the Artsoft division of Hill Arts and Entertainment Systems, Inc.

With the new system in place, the Kennedy Center has gained speed and efficiency in ticketing, as well as better audience data for its marketing and fund-raising efforts.

"The Artsoft system has enabled the Kennedy Center to consolidate its various customer databases into one integrated database," said Charlie McKnight, project coordinator for the Kennedy Center. "As a result, we now have more flexibility, better sales analysis and reporting, and better target marketing."

The Kennedy System is running its box office system on a Digital Equipment Corp. VAX 6000 computer that is linked to several hundred personal computers and terminals via the DECnet networking protocol.

When a Kennedy Center box office employee needs to determine the best available seats for a performance, it is possible to search through as many as 1,500 seats with the click of a mouse. The software also allows searching access to the best possible seats for a range of performances.

According to Dirk Epperson, vice president of research and de-

(continued on page 20)

Oracle rolls out version of Oracle Card for Macs

By Timothy O'Brien
West Coast Bureau Chief

REDWOOD SHORES, Calif. — Oracle Corp. last week announced the immediate availability of a new version of its Oracle Card graphical client/server development tool for Apple Computer, Inc.'s Macintosh.

Oracle Card for Macintosh Version 1.1 offers an enhanced graphical interface, QuickTime multimedia support with scripting commands and compatibility with IBM DB2 databases.

In addition, the programmer's extensions for Oracle Card, which until now were available separately, have been integrated into the product to provide a more complete application development environment.

"Oracle Card Version 1.1 is the first client/server tool from Oracle that truly provides a vision of the next generation of multimedia applications," said Marc Benioff, corporate vice president of Oracle's New Technology Division. "For very little work, developers can build multimedia applications and, for the first time, access IBM DB2 data, as well."

The new QuickTime movie object in Oracle Card for Macintosh lets developers incoporate video into client/server applications. New movie commands build on the existing scripting environment, which provides developers built-in paint, draw and text objects.

Support for IBM's DB2 database management system lets these client applications use IBM mainframes as servers across a network. Oracle Card's DB2 support allows Oracle Card applications to operate with IBM's database in the same way they currently operate with the full Oracle Server database.

Oracle Card Version 1.1 is for

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Conference demo features application

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senting hypertext links and view related notebooks residing on other servers.

"But that's boring," he said. "The interesting portion enables attendees to add their own information."

That portion of the demo, called Wining and Dining in Washington, D.C., listed notebooks with information on several Washington-area restaurants. Attendees clicked on these notebooks to view menus, photos of the restaurants and maps showing how to get there.

Then, using menu selections, they built their own notebooks listing their experiences at the various restaurants. These notebooks were stored on a server and, if the attendee decided, were linked to the original restaurant notebook. Other showgoers could then view attendee critiques.

Burger said VNS is designed as a group collaboration tool for users who need to communicate with others working on different networks or computers or in completely different companies.

New apps system takes center stage

continued from page 19

velopment at Artsoft, his company selected Sybase as the engine for the box office system not only because of the features in SQL Server, but also due to the customizable options and third-party connectivity found in Sybase's Open Server product.

Because using SQL queries to search through all of the possible seating variations would potentially be too slow for some box office operations, Artsoft developed a seat selection database in Open Server that holds all of the possible seating variations in cache memory.

In addition, the Artsoft application relies on connectivity to outside data sources made possible through Open Server for credit card authorization, seat selection and ticket processing operations.

"For The Kennedy Center, the box office is perhaps the most mission-critical application in the organization," Epperson explained. "Now that they are up and running, they are cranking out tickets much faster than they were in the past and, at the same time, gathering information on their patrons."

Artsoft has more than 100 clients using its turnkey arts management system, including prestigious organizations such as the American Conservatory of Music, the Manhattan Theater Club and the Philadelphia Orchestra.

The American Conservatory of Music, prior to using Artsoft, kept information about its subscribers in shoe boxes.

▲▲▲

In some cases, the transition from manual ticketing to automated box office systems has been dramatic. For example, the American Conservatory of Music, prior to using Artsoft, kept information about its 18,000 subscribers in shoe boxes.

While Artsoft has for years offered a multiuser, low-end box office system for Novell, Inc.'s NetWare, Artsoft has in the past year developed the full client/server Sybase version for arts organziations with more rigorous demands.

Epperson used Sybase's APT Workbench tools to develop the client software, which utilizes a graphical user interface to guide the user through various windows or scripts to complete the associated tasks.

Prices for the Artsoft system start at $50,000, depending on configuration.

Oracle rolls out version for Macs

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any Macintosh running the System 6 or 7 operating system with 4M bytes of random-access memory. OracleCard must be run with either the Oracle Server database or Oracle's communications software, SQLNet.

Oracle Card Version 1.1 for Macintosh is available now in a developer's version and in a run-time version. The Windows version has been available since last spring.

The developer's version, which includes Oracle Card and the programming extensions, is available for $699. The run-time version is available at a price of $299 for one license, as well as in prediscounted quantities for larger numbers of licenses.

Worth Noting

"IBM doesn't just need a brain transplant, but also a blood transfusion. In addition to getting a new CEO, IBM also needs to get rid of 150 to 200 vice presidents and high-level managers."

Paul Deninger
Managing director
Broadview Associates, L.P.
Fort Lee, N.J.

People & Positions

Northern Telecom, Ltd. of Toronto has announced that **Paul Stern** has resigned as chief executive officer effective March 1 but will remain with the company as the nonexecutive chairman of its board. Stern said he is resigning to pursue outside interests, including an appointment as a visiting professor at the University of Pennsylvania's Wharton School. **Jean Monty,** president and chief operating officer, has been named to the CEO position.

Network Equipment Technologies, Inc. (NET), a Redwood City, Calif., multiplexer vendor, has named **Raymond Peverell** senior vice president of worldwide sales. He had been vice president of strategic partnership development at Tandem Computers, Inc. He replaces **Craig Tysdal,** who is leaving NET next month.

Stephen Hochschild, formerly director of developer relations at **Novell, Inc.,** has joined **Lotus Development Corp.** of Cambridge, Mass., as director of developer relations. He will manage the firm's relationships with third-party developers.

The National Competitiveness Act of 1993 (S. 4)

Introduced by Sen. Ernest Hollings (D-S.C.) with 9 Senate cosponsors

The bill would cost $2.9 billion through 1995 and establish the following:

New program	Goal
Twenty-First Century Manufacturing Infrastructure Program within the National Institute of Standards and Technology	Help develop computer-integrated manufacturing systems and networks.
Advanced Manufacturing Technology Development Program	Create a network test bed to test software and equipment.
National Manufacturing Outreach Program	Help small and midsize firms to use modern manufacturing technologies through Outreach centers.
Civilian Technology Loan Program	Provide loans to high-tech companies at the government borrowing rate plus 2% insurance surcharge.
Information Infrastructure Development Program	A 5-year plan, developed by an industry advisory committee and the government, for a network that U.S. citizens can use to exchange information. Also calls for government agencies to develop network test beds for medical imaging and digital libraries.
Office of Technology Monitoring and Competitiveness Assessment	Collect and distribute information on foreign science and technology capabilities and policies relative to the U.S.

Bill would help put U.S. back in high-tech game

Gives feds stronger position in development.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — Democrats here are hoping a new bill to spend $3 billion on manufacturing and network technologies will legislate away the problems U.S. industry is having with foreign competitors.

The National Competitiveness Act of 1993, introduced by Sen. Ernest Hollings (D-S.C.), would give the federal government an expanded role in developing communications technologies, funding high-technology startups and creating network test beds to test and develop manufacturing systems.

Tucked away inside the mammoth bill is the reincarnation of last year's Information Infrastructure and Technology Act of 1992, unsuccessful legislation Vice President Al Gore introduced as a senator.

Senate sources last week said the vice president worked with the Senate in crafting the portion of the Hollings bill that includes the Information Infrastructure Development Program to plan a national network.

The National Competitiveness Act contains a little something for everyone, including funding for wind engineering research and semiconductor lithography technologies. Its shotgun approach is intended to counter Japanese and European state-funded research programs.

"For years, several of us in Congress have watched other governments actively support their companies, their workers and their national prosperity while our government stood on the sidelines, blinded by a simplistic, indifferent economic ideology that ignored the global economic challenge facing us," said Hollings in a jab at the departed Bush administration.

"The results have been clear and often devastating," he added. "Entire United States industries have been lost, and now the Department of Commerce estimates that the United States is losing — and losing badly — to Japan and Europe in many of the key emerging technologies."

Another sponsor of the bill, Sen. John Rockefeller (D-W.Va.), blamed the Bush administration for not spending more on research and development, which he said led to a lack of venture capital. This has driven high-tech firms in the U.S. to find Japanese investors to keep them going, Rockefeller said.

With the aim of helping small and midsize businesses in particular, Senate Democrats are proposing that the Commerce Department establish Manufacturing Outreach Centers and other programs to promote the use of electronic data interchange, multimedia, interactive systems and computer-integrated manufacturing (see graphic, this page).

The bill would also allow the

(continued on page 24)

Start-up companies target '93 net needs

Client/server management, integrated net access and development tools lead list of new offerings.

Second in a two-part series on companies to watch in the network industry this year.

Aggregate Computing

Certain that the world will always want a better mousetrap, start-up Aggregate Computing, Inc. last April released its first product, NetMake Version 1.0, to provide software developers with a faster way to compile code.

The NetMake tool is designed to replace the standard Unix "make" utility and cut down on the time software developers lose while waiting for programs to compile. With NetMake, compiling jobs can be distributed to multiple Unix-based machines on a network, rather than having to rely on a single workstation.

NetMake can tell which type of Unix workstation is on the network and whether it is free, dishing out parts of the compiling job to the appropriate computers. This results in time savings, in some cases, reducing a job that used to take an hour to just 15 minutes.

Before the end of this year, Aggregate Computing will be licensing NetMake's core technology, the resource management service NetShare, to third-party application developers under what the company calls its Partners Program.

Aggregate Computing, Inc.

Based: Minneapolis
Founded: 1990
Primary business: Development tools for distributed computing

"We're putting programming interfaces on NetShare and publishing them so that third parties can build other applications like NetMake," said Joan Wrabetz, president of Aggregate Computing, who also chairs the Open Software Foundation, Inc.'s Distributed Computing Environment Special Interest Group.

— Ellen Messmer

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NET FINANCIALS

Banyan nets revenue, earnings growth. Banyan Systems, Inc., a Westborough, Mass., local-area network operating system vendor, last week posted revenue for the fourth quarter of $30.6 million, up 12.5% from the fourth quarter of 1991. Fourth-quarter earnings climbed 76%, from $1.7 million to $2.9 million. For the year, Banyan had revenue of $113.5 million, a 13.4% rise from the company's 1991 revenue. Earnings for 1992 totaled $8.2 million, more than double the $2.9 million in 1991 earnings.

1992 a good year for Sybase. Sybase, Inc., an Emeryville, Calif., database software vendor, last week reported fourth-quarter revenue of $83.2 million, up 64% over last year's fourth quarter. Earnings reached $10.7 million, more than double the 1991 fourth-quarter total. Sybase posted revenue of $264.6 million, 65% higher than 1991. Earnings for 1992 more than tripled from the year before to $23.7 million.

GDC reports sales, earnings. For its first fiscal quarter of 1993 ended Dec. 31, General DataComm Industries, Inc. reported revenue of $54.7 million, up 18% from the first fiscal quarter of 1992. First-quarter earnings for the Middlebury, Conn., multiplexer vendor were $1.6 million, about triple the $553,000 in earnings posted in 1992's first quarter.

COMPAQ PRINTERS NOT
PEOPLE PRINT, THEY CHAN

When we first introduced our network printers, the experts were at a loss for words. Not because they had little to say. The problem was finding words for printers that thoroughly outperformed all others.

When you add together the performance, paper-handling and unique network capabilities of the COMPAQ PAGEMARQ Network Laser Printers, it's no wonder they have received such overwhelmingly favorable praise from the industry's leading analysts and experts.

Powerful print engines along with our own RISC-based controllers, for example, produce output faster than any other printers in their class.

And so that printing quickly doesn't translate into quickly running out of paper, the COMPAQ PAGEMARQ 20 holds up to 1500 sheets of paper—more than any other desktop printer.

What's more, both the COMPAQ PAGEMARQ 15 and 20 can accommodate practically every size of paper, up to 11" x 17".

In complex network environments, even the biggest problems are no problem for COMPAQ Printers. Our intelligent emulation sensing feature, for example, automatically adjusts from

Network Printers Steal HP Thunder

Compaq's new low-cost, high-speed PageMarq laser printers should give the Hewlett-Packard LaserJet IIIsi a run for its money. The PageMarqs fix the major deficiencies of many earlier network

–PC Week, September 7, 1992

Compaq's Pagemarq Series offers users just about anything they could want in a reasonably priced line of network printers.

–PC Magazine, December 22, 1992

nt and best of all, a fax-modem board
d that turns the printer into a plain-
paper fax that can receive faxes even
as it handles incoming print jobs.
is included that
DOS P

– Macworld, January 1993

ONLY CHANGE THE WAY GE THE WAY PEOPLE WRITE.

PCL to PostScript and back again without your having to do a thing. So whether people on your network are using PCs, Macs, or both, COMPAQ Printers can easily and effortlessly take care of what everybody needs.

> On a desktop-publishing document that contained mixed text and graphics, the PageMarq 20 was almost 100 percent faster than the LaserJet IIIsi, while the PageMarq 15 ran about 50 percent faster than the HP printer.
>
> *—PC Week, September 7, 1992*

We've also included five separate interfaces to allow for a variety of network connections. You can simultaneously run Token Ring or Ethernet, AppleTalk on LocalTalk, a serial and parallel port, and even an optional Internal FAX Modem that allows you to send and receive presentation-quality faxes directly from the printer.

In addition to all that, our printers are covered by CompaqCare, the most extensive service and support program in the industry.

> Compaq is bringing a printer to the network printer market after listening to its most important resource: its customers. The PAGEMARQ series is a direct result of users' wants and needs.
>
> *—BIS Special Report, August 1992*

> **printer sho**
>
> According to analysts at BIS Strategic Decisions in Norwell, Mass., the Compaq printer has scored a bull's-eye. "Its kind of features are state-of-the-art. They've
>
> *—Computerworld, September 21, 1992*

You get a free one-year warranty with on-site service, as well as unlimited technical support via our hotline for as long as you own the printer.

For more details on the COMPAQ PAGEMARQ Printers, call. In the U.S., we're at 1-800-345-1518. Or in Canada, you can call us at 1-800-263-5868.

And find out more about the network laser printers that everybody's talking about.

And writing about.

According to PC Week, the COMPAQ PAGEMARQ Printers "speedily handle even complex documents."

The envelope please . . . In the few months since their introduction, our printers have already won eight prestigious industry awards.

COMPAQ

Bill would put U.S. in high-tech game

continued from page 21

Commerce Department to make a total of $240 million in loans through 1995 to small and midsize businesses to finance the development of advanced civilian-use technologies, such as electronics and biotechnology.

While unveiling S.4, the bill's Senate backers emphasized they will introduce more legislation dealing with manufacturing that will offer plans for defense technology funding, trade and tax rules, as well as employee training.

Although the senators backing the $3 billion Hollings bill hope President Clinton will see his campaign promises in it, Senate sources acknowledge that the president has not yet sounded his views on the bill.

However, hearings in the upcoming month will likely make it clear how willing the new administration is to make the National Competitiveness Act one of its primary vehicles for federal investment aimed at bringing economic growth.

Start-up companies target '93 net needs

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Premisys

Start-up Premisys Communications, Inc. has an answer for users worried about investing too heavily in any one technology in the evolving WAN market.

The company's integrated access device, dubbed the Integrated Multiple Access Communications Server Model 800 (IMACS/800), can be configured to support a range of existing and emerging carrier services, so customers can adopt new options as they become available without having to overhaul their networks.

"Carriers are coming along with so many new services that users can't make up their minds about which ones to use because the cheapest service today might not be the cheapest tomorrow," said Bob Lefkowits, vice president of marketing at Premisys, based in Palo Alto, Calif. "Our platform supports one-stop shopping for carrier services."

The IMACS/800 is a modular device that combines the functions of channel banks, multiplexers, modems and data service unit/channel service units. It features an 80M bit/sec control bus for the system's

Premisys Communications, Inc.

Based: Palo Alto, Calif.
Founded: 1990
Primary business: Integrated network access devices

modules and 12 4M bit/sec time-division multiplexer buses for supporting network traffic.

On the carrier side, the product supports modules for features and services such as inverse multiplexing and Integrated Services Digital Network Primary Rate Interface. It will support frame relay by year end and Switched Multimegabit Data Service (SMDS) next year.

On the user side, the device features data, voice and video modules to interface with private branch exchanges, telephones, video coder/decoders and cluster controllers, among other devices.

The knock critics have on Premisys is that the company is trying to do too much and, as a result, will not be especially strong in any one area. But Lefkowits counters that, saying Premisys' strategy is to leverage work by other vendors where possible. The firm is working with AT&T Paradyne on voice compression and with ADC Kentrox on SMDS.

"For Premisys to have its greatest success, the company needs to partner with an established backbone vendor, such as Newbridge [Networks, Inc.], and provide access solutions to their backbone switches," said Curtis Price, an analyst at International Data Corp., a Framingham, Mass., market research firm.

Premisys was formed in 1990 by former Telco Systems, Inc. executive Ray Lin to take advantage of what could be a huge market. Vertical Systems Group, a Dedham, Mass., market research firm, expects the multifunction access device market to grow from less than $10 million in 1992 to more than $200 million in 1995.

— Bob Brown

EcoSystems

Providing system management products for distributed computing environments is something few vendors have dared to try. But as more users turn to client/server-based computing, the demand for tools to monitor and control networks, applications and hardware will grow, analysts said.

Start-up EcoSystems Software, Inc. aims to gain an early foothold in this mar-

(continued on page 41)

Worth Noting

"People assume that achieving a high level of interoperability and interconnectivity is expensive. It isn't. In fact, it will probably end up costing you less in the long run."

John Puckett
Manager of engineering and network services
The Foxboro Co.
Foxboro, Mass.

Manager Minutes

The **Electric Power Research Institute (EPRI)** and **Pacific Gas & Electric Co.** will be holding the third meeting of the Forum for Electric Utility Manufacturing Message Specification (MMS) Implementation Feb. 10-12 in Monterey, Calif.

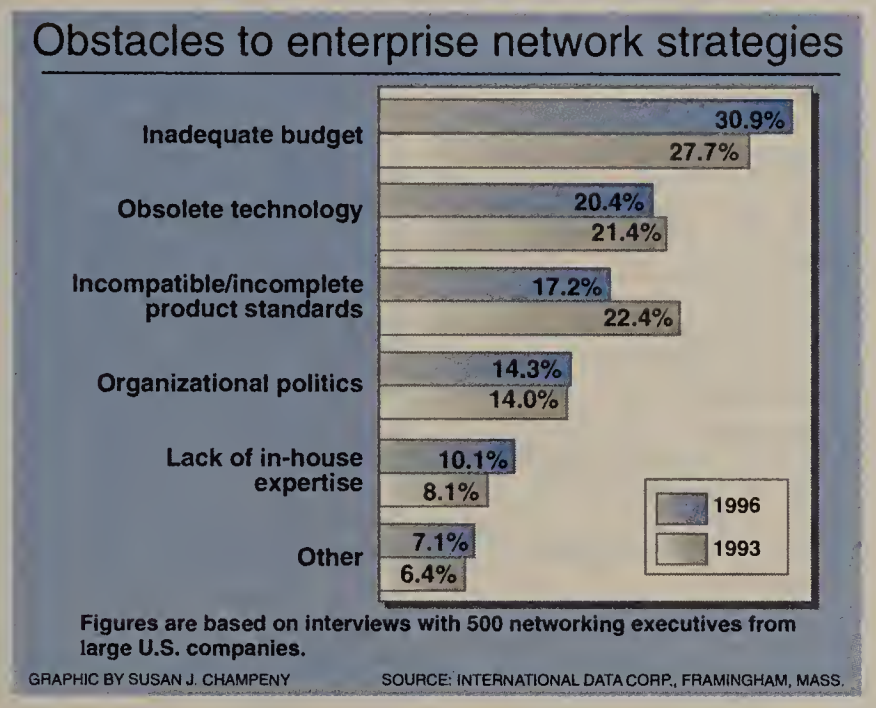
MMS is a messaging standard for data acquisition and control applications and is cited in the Utility Commissions Architecture profile for a range of electric utility functions.

For more information, call EPRI at (510) 525-1205.

The University of California, Berkeley Extension is offering two courses this spring on internetworking topics.

The Internetworking Technology course on April 13-14 will deal with the practical problems of interconnecting dissimilar systems and discuss compatibility issues relating to bridges and routers. Internetwork Management, to be held May 14-15, will deal with the management and administration of large internetworks. The courses cost $445 each or $795 for both.

For more information, contact the Berkeley Extension at (510) 642-4151.



NW 500 survey points to importance of net strategy

Enterprise plan gives users competitive edge.

By Joanne Cummings
Senior Writer

WASHINGTON, D.C. — As companies look to control costs and maximize information systems (IS) investments, building and managing enterprise networks is becoming increasingly critical, according to a survey of the 500 largest user companies that subscribe to *Network World*.

The study, called the Network World 500, was conducted by International Data Corp. (IDC), a market research firm in Framingham, Mass., and was cosponsored by *NW* and World Expo Corp.

The results were presented at last week's ComNet '93 show by Kim Myhre, senior vice president of IDC, who also brought a group of vendors into the act.

Myhre outfitted 16 vendors with wireless terminals provided by ARDIS Motorola that enabled them to compare their responses with those of the NW 500.

Surprisingly, the results were fairly similar.

The NW 500 found that the major impetus for developing an enterprise net strategy is to support critical business applications, with 40.8% of the respondents citing it as their primary objective. In comparison, 51% of the vendors said supporting critical business applications was of primary importance.

The results show that more companies are viewing network technology as a way to become more competitive, rather than as a way to automate current processes.

A nearly equal number of respondents, 38.1%, cited maximizing IS investments as the primary objective of their net strategy. These respondents said enterprise nets improve sharing of systems, peripherals, applications and information across the corporation, providing for increased efficiencies. In comparison, cost control was cited by just 17.9% of the respondents.

In addition, the survey found that corporate business management is playing an important role in forming enterprise network strategy. In 59.8% of NW 500 companies, corporate management views the enterprise net strategy as a key element of the business strategy.

As for monetary issues, respondents' operating budgets are expected to remain relatively flat for the next two to four years, but the study found that capital expenditures for network equipment is expected to rise 21% between 1992 and 1994.

The most critical area of investment cited by the NW 500 was local-area networks, followed by network management, internetwork equipment and carrier services.

Interestingly, the vendors' first response was internetworking equipment, followed by net

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MANAGING TECHNOLOGY

BY ERIC SCHMALL

The customer isn't always right

For years now, we've been awash with books and articles advocating the supremacy of customer service in all we say and do.

While no right-thinking network manager should ignore the primary importance of this concept in providing information services, it is time to recognize that this principle, when taken to extremes, can also inflict considerable damage within the organization.

I have witnessed numerous incidents where middle and senior managers have received calls from angry customers over what was perceived as poor service. In these cases, network staff had tried to accommodate users' requests but couldn't follow through without, for example, violating strict corporate guidelines about equipment standards.

In these isolated cases, the users complained to senior management, and senior management responded by calling in the staff for a firm lecture on customer service. They didn't want to hear the story from the technician's side. They saw the customer complaint and lit into the staff.

Aside from embittering employees, this kind of knee-jerk reaction to customer complaints also engenders a pervasive and expensive cynicism. Rather than face the wrath of management over a customer demand, the staff begins to fulfill any order, no matter how ludicrous. This behavior grows out of fear of the users and resentment toward the senior staff. And once this atmosphere is created, things deteriorate rapidly.

Under these circumstances, nobody challenges user requests, nobody inquires about the underlying reasons for requested changes and no one asks about helping design new applications. They fear that if they ask too many questions — especially of the users who are quick to call management — they'll be quickly labeled "not service-oriented" and called back for another lecture.

Just as tragic, you can expect any sense of budget adherence to become a distant memory. When the customer is the unchallenged king, people will be reluctant to mention standards or guidelines. They'll allow the customer to order whatever he wants. This invariably means wasteful diversity in equipment and services that only drives up costs later when everything has to be made compatible.

This trap can be avoided if we commit to customer service from a rational rather than a rabid approach.

Let your staff know that you firmly believe in the basic principles of good customer service but that you are also aware that some customers don't always act as rational beings. Tell them they should always try to meet customer needs, but let them know there are limits. And educate them on dealing with difficult customers diplomatically.

But most importantly, promise your loyalty to your staff. Tell them you will never take a customer's story at face value without hearing their side, as well. Explain to them that you expect them to form a partnership with customers based on mutual respect, not fear. And pledge that you will never pervert the service philosophy as an instrument to treat your staff worse than you would ever allow them to treat a customer.

Schmall is director of telecommunications for an insurance holding company. His column appears the second week of every month.

OPINIONS

LEGAL ISSUES

BY RICHARD RAYSMAN AND JEFFREY NEUBURGER

Connectivity certification gives users safety net

Before contracting for network equipment or services, users would be wise to negotiate with suppliers for written assurances of compatibility with application programs. Such certifications are the key to eliminating the risk of incompatible software.

Although users should seek blanket certifications of compatibility between applications and network systems, vendors are often reluctant to provide such assurances since there are many technical factors beyond their control. Instead, vendors will compromise by offering to certify connectivity with the application, which guarantees that the network and application are able to pass data packets.

Since vendors may have to do considerable work to certify connectivity, users should raise the issue of certification at a preliminary stage in the contract negotiation. At that time, the user should provide the vendor with a list of applications it intends to run on the network. The vendor will need to examine each application's specifications to evaluate whether the network and the application can establish connectivity. In some cases, both parties may decide to call in the application provider to work out any differences.

Even if the vendor finds that the network can establish connectivity with an application, the supplier will still be likely to offer only a limited certification. For example, to receive connectivity certification, the vendor may require the user to adopt its recommended hardware and software configuration. The vendor may also specify that any change to the configuration or application, such as an upgrade, will void the connectivity certification.

If the user discovers a connectivity problem prior to signing the contract, the user can leverage that information with the network and application vendors. Both vendors will be motivated to work together to resolve the problem because each will know that its contract with the user may be dependent on achieving connectivity.

It is likely that the user will want to add an application to the network sometime after the network contract has been finalized. If the contract does not specify the vendor's obligations in such circumstances, the network vendor has no obligation to evaluate the application's connectivity.

The contract should, therefore, provide that a vendor will work in good faith to examine new applications and evaluate whether network connectivity can be established. Additionally, the contract may stipulate that the network vendor perform such work either for a fixed fee or on a time-and-materials basis and will cooperate with third parties in conducting such evaluations.

For users, investigating the ins and outs of connectivity certification is well worth the effort. By becoming aware of these issues prior to the contract's execution, the user can save time, money and frustration.

Raysman is a partner and Neuburger is an associate with Brown Raysman & Millstein, a New York-based law firm.

NETWORK WORLD
The Newsweekly of User Networking Strategies

EDITORIAL

NW 500 issues a call to action for users and vendors

The Network World 500 survey, presented at last week's ComNet '93 conference in Washington, D.C., provided a wealth of insights into the strategies and concerns of top network executives. But a couple of findings in the survey — jointly sponsored by *Network World*, market research leader International Data Corp. and World Expo Corp., sponsor of ComNet — warrant particular attention.

Case in point: Nearly 60% of the respondents said corporate management views enterprise network strategy as a key element of business strategy. That's refreshing news given all the talk lately among pundits that information systems (IS) and network investments have failed to produce real payoffs for U.S. businesses and that IS and net executives haven't been successful in aligning business and technology strategy.

But it says a good deal of work remains. For too many of these firms — which represent the top spenders in the net products and services market — a big gap remains between IS' and upper management's perception of the value of technology investments.

That's a dangerous gap that network executives have to work hard to close if they don't want to find themselves out of a job.

On another front, respondents were asked if carriers will become a more important factor in their enterprise network strategies as they roll out advanced data services, such as frame relay and Asynchronous Transfer Mode. Despite all the promise of these services, more than half of the respondents expressed doubt that carriers would become key partners.

In short, users still have major questions about carriers and their role in supporting emerging LAN internetworks across an enterprise. What users need is for carriers to clarify their positions with regards to LAN internetwork service, and they need that information soon. For both users and carriers, the Network World 500 survey represents a clear call to action.

INFORMATION ACCESS

BY MARY JOHNSTON TURNER

CPE trends are likely to drive future net design changes

The way network users access information is about to change dramatically. Three major trends in the customer premises equipment market will force network and applications planners to rethink network and systems design and operations strategies.

These key trends are:

- Multimedia's ability to shift information from real-time to store-and-forward mode.
- The proliferation of new, user-friendly interfaces.
- The growth of low-cost wireless devices.

Multimedia will be the catalyst for a wholesale shift in the way enterprise networks must be designed. Documents, until now mainly comprising text files, will increasingly be transformed into large, complex files containing voice, video or image, as well as text. From a network and systems perspective, this means that traditional real-time applications will now be merged into store-and-forward messaging and file transfer applications.

As more traffic becomes store-and-forward in nature, network managers will have to rethink backbone network capacity planning, information server sizing and placement and storage strategies. Perhaps most importantly, they will have to train users to think differently about how they manage information.

Users will have to decide whether it is truly worth interrupting a colleague with a real-time message or whether a complex store-and-forward document is more appropriate. Application developers will have to be educated regarding the flexibility of new document types and consider the network impact of real-time vs. store-and-forward application design.

The shifting nature of network capacity requirements will be accelerated by the proliferation of interfaces that will make store-and-forward communications easy to use even by technology-phobics.

Over the next few years, speaker-independent natural speech recognition systems will replace key pads and other less friendly interfaces. End users will find stylus interfaces, voice front ends and touch-screen type graphical workstation interfaces making databases more accessible with less training required.

> Multimedia will be the catalyst for a shift in the way enterprise nets must be designed.
>
> ▲▲▲

As application developers take advantage of these new information interfaces, network bandwidth demands will escalate. This will affect not only network capacity planning but also security system design. It may also require development of more sophisticated help desk and remote customer premises equipment and application monitoring to allow network managers to assist naive users.

Finally, the wireless revolution will make mobile information access more a norm than an exception. Users who normally rely on a desktop personal computer or workstation to access electronic mail, stored files and business-critical applications will demand a means of gaining access via wireless systems. For example, wireless users will want to call into the E-mail to scan through a synthesized speech menu, which reads the message headers, message sources and message sizes, and gives the user the option of having the entire message read over the wireless network.

These proliferating customer premises equipment options are going to be great news for end users who want more flexible systems for accessing information. Easy-to-use interfaces will allow many corporations to improve worker productivity, automate more tasks and provide more efficient service to customers and suppliers. Next-generation customer premises equipment will embrace a new set of users who have so far been disenfranchised from the information revolution.

But the downside is that network managers will have to monitor and support more complex environments than ever before. Network design, capacity planning and management strategies will have to be reevaluated to ensure that they adequately accommodate the changing customer premises equipment market.

As always, innovation breeds new challenges for network managers. Those who can help their companies leverage new customer premises equipment first will see the greatest competitive advantage.

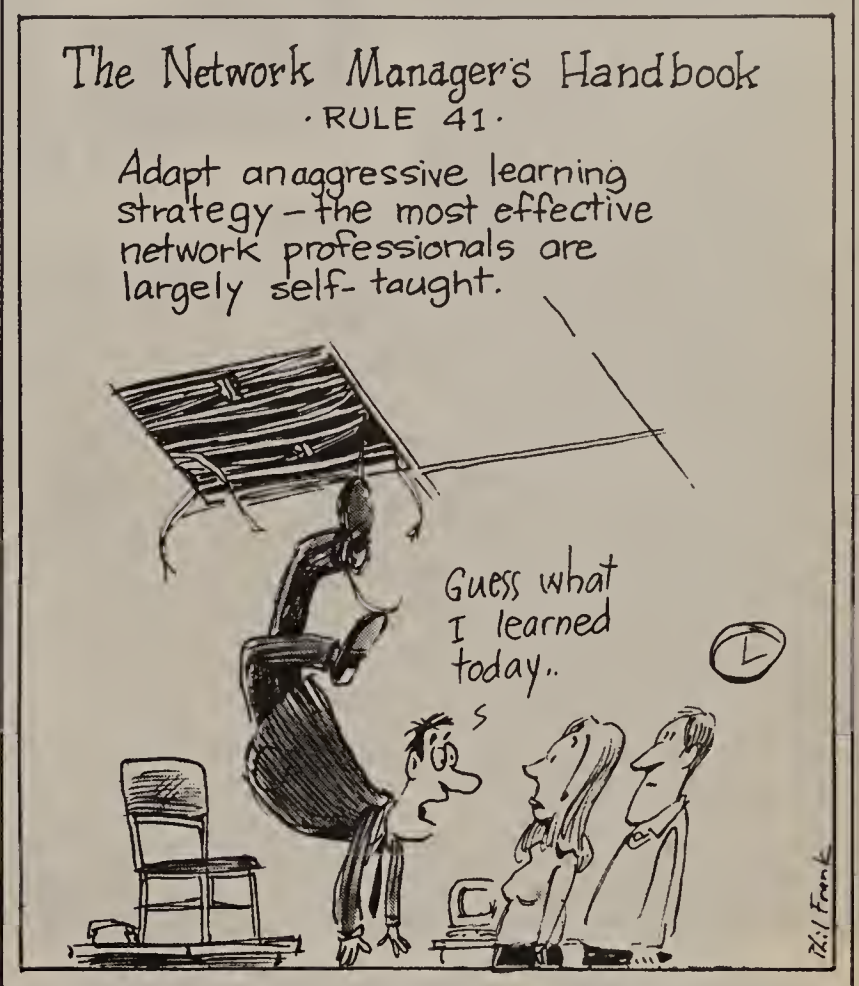
Turner is a principal with Northeast Consulting Resources, Inc. She provides strategic and technical planning to end users and vendors in the areas of internetworking, global services and outsourcing. She can be reached at (617) 570-0790.

HELP IS ON THE WAY! If you have a question regarding a product, service or technical problem, submit it to our Network Help Desk. We'll contact vendors, network integrators, consultants and other experts to get an answer for you.

You may submit questions to Susan Collins, associate features editor, by calling (800) 622-1108, via fax at (508) 820-3467 or via *Network World's* bulletin board (see logon instructions, page 2).

TELETOONS

BY FRANK AND TROISE



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New ways to deal with an old problem

By ERIC SMALLEY

Aided by a bevy of new products, users are crafting strategies to overcome network printing hassles.

Many users cite the need to share printers as one of the primary reasons for installing local-area networks, yet printing is treated as an annoying fact of life in today's multivendor networks.

What makes printing so annoying is that demand for printing services on networks remains high, and complex networking environments just keep adding to the problem. Users have to figure out where to locate printers, how to connect them to the network, whether to centralize or distribute print queues and whether print software should be in a printer or network server.

Low budget or low priority?

The results of a recent International Data Corp. (IDC) user survey show the average budget for network printing is $16,000 a year per local-area network, a relatively small amount according to Angele Boyd, director of printer research at IDC.

Vendors are beginning to address these issues by developing printing schemes that cover print queue management, job management and administration. Some are even designing printers that attach directly to the network. These hardware and software issues are related — but not interdependent — because the way a printer attaches to the network does not necessarily determine whether it can participate in one of the emerging print schemes.

Nonetheless, users looking to overcome printing problems are turning to network-attached printers, ones that have a built-in network interface and run print management software. But traditional approaches of attaching a printer to a network workstation, dedicated print spooler or file server still work.

"We've gone the whole gamut," says Greg Scott, computer services manager for Oregon State University's College of Business. The school has tried many approaches, including network-attached printers, remote printing and third-party software that makes printers available to all network users. "We've pretty much landed on directly connecting printers to Ethernet."

The College of Business is a Novell, Inc. NetWare shop, running NetWare 3.11 on 12 servers and 250 workstations. The college has about 20 net printers, according to Scott.

Wave of the future

Emerging network-attached printers have just about everything a user needs, including a direct network attachment that enables them to receive information at top network speed and print it quickly. These emerging network printers also run software that makes them easy to manage.

The traditional approach of attaching a printer to another network device suffers from speed and management problems. With this approach, printers must be linked to a network-attached device via a serial or parallel port, which does not support many LAN speeds. Because this approach also makes the printer a peripheral to the network-attached device, the printer is more difficult to manage.

Because of the advantages they offer, many analysts say network-attached printers are the wave of the future. Direct network attachment is gaining popularity for a number of reasons, not the least of which is the ability to put the printer where the users are without burdening any workstation. Since LAN cables snake throughout offices to link workstations, a printer can more likely be placed where users need it.

"There's always access to the Ethernet cable," Scott says.

Another key advantage to directly connecting a printer to the network is speed. With a direct network attachment, printers can receive data at LAN speeds. Parallel and serial links provide only a fraction of a LAN's bandwidth.

The Centronix communications protocol used by printers that link to network-attached devices via the parallel port has a throughput of only between 80K and 160K bit/sec, according to Ken Hunt, product-line manager for Hewlett-Packard Co.'s JetDirect printer cards. The parallel link is also one way, meaning infor-

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mation cannot be transmitted from the printer back to network-attached device, thus making management difficult.

Only printers with internal net interfaces can utilize the increased throughput of a direct LAN. The speed gains cannot be realized for printers attached to the network via a print-sharing device such as Intel Corp.'s NetPort, which has multiple parallel ports to support printers and a single network interface. Such devices provide freedom in deciding where printers are located but not added throughput.

Throughput is becoming increasingly important as print jobs include more graphics. The move to graphical user interfaces is causing an increase in graphics in print jobs, says Scott, whose site has standardized on Microsoft Corp.'s Windows.

"We have PostScript files that are absolutely enormous," Scott says. The school uses HP JetDirect network adapter cards to connect HP LaserJet IIISi printers to an Ethernet LAN. "You plug the card directly into the printer. It's very clean, very reliable and very, very fast."

Yet another benefit of direct network attachment is improved printer management. Traditional communications between computers and printers has been minimal and largely one way. Determining the printer's status over parallel or serial links is nearly impossible.

When the printer becomes a network device, it can be managed using network management systems. For example, HP's JetDirect cards support the Simple Network Management Protocol and HP has developed a printer Management Information Base, which the company is expanding, according to Hunt.

Using SNMP, network management systems can "autodiscover" printers that are added to the network, determine the status of the printers and react to printer events, Hunt says. These capabilities are likely to lead to improved printer administration.

In one scenario, printer information gathered by the network management system is not brought to the attention of the network manager but to the administrator responsible for the printers. With this information, the administrator can clear backed-up print queues or resupply printer resources before end users call to complain.

Direct network attachment also allows organizations to centralize administration of hard-copy output, allowing administrators to download approved fonts and forms from network servers to the printers, Hunt says.

Another benefit of direct network attachment is improved printer management.

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One drawback to direct network connection is cost. Direct network connections require a network-ready printer, a network adapter card or a third-party LAN-to-parallel port interface — all of which are more expensive than a parallel or serial cable.

Another potential drawback is that using network management to control printers can add to network managers' burdens and add overhead to the network in the form of increased net management traffic.

For most users, the advantages to direct attachment will likely outweigh the drawbacks.

Printers that are directly connected to the network can be broken down into four categories, according to Bryan Corrigan, senior industry analyst for BIS Strategic Decisions, a Norwell, Mass.-based market research firm.

At the high end are printers such as the Xerox Corp. 4235, which has a built-in personal computer, a long list of features and a price tag of $35,000. These high-end devices, often called production or enterprise printers, are used mostly for high-volume production printing and are rarely used for office support applications. Production printers also tend to use different printing protocols — such as IBM's Intelligent Print Data Stream — than departmental or work group printers.These printers can print 30 or more pages a minute.

Another category is multifunction printers, which combine print and facsimile services. This is an emerging segment of the market, Corrigan said.

The so-called dumb printer model, exemplified by Sun Microsystems, Inc., is yet another category. Sun uses dumb printers in its network printing scheme, which is called NewsPrint. In NewsPrint, printers are little more than print engines controlled via software running on workstation-based servers. In 1991, this approach helped earn Sun the No. 2 spot for sales of printers in the Unix market that operate at 12 to 19 pages per minute, Corrigan says.

Sun describes NewsPrint as a "printer operating system" that runs on a Sun workstation. The workstation becomes a print server handling users on personal computers, Apple Computer, Inc. Macintoshes, Unix workstations and minicomputers. It also supports Sun, Apple and HP printers connected to the Sun workstation or directly to the network. Through a piece of Sun software called NetWare Sunlink, NewsPrint can also act as a NetWare print queue. NetWare print jobs are forwarded to Sunlink, which converts the job for processing on NewsPrint printers.

The fourth category com-

prises printers operating below 20 pages per minute and costing less than $5,000, according to Corrigan. Many recently introduced products fall in or near this category, including printers from Compaq Computer Corp., QMS, Inc. and HP. These devices are also called network-ready printers.

The current generation of network-ready printers has raised the standard for printing speeds. Minimum performance requirements for network-ready printers range from eight pages per minute and 5,000 pages per month for one to five users, to 35 pages per minute and 50,000 pages per month for 21 to 25 users, Wecksell says (see Figure 1, page 32).

Network-ready printers should have the ability to read the data stream as it comes in and switch page-description languages on the fly before printing each job, a capability called emulation switching, according to Joel Wecksell, vice president with Gartner Group, Inc., a Stamford, Conn.-based market research firm.

A page-description language defines a set of instructions about how a print job is to be formatted. Network-ready printers should also have Reduced Instruction Set Computing processors for the necessary horsepower as well as built-in Ethernet and token-ring interfaces for high throughput (see Figure 2, page 32).

Printers in this last category make up a fast-growing market, according to analysts. Network-ready printers address users' complaints about the lack of performance for network printers, according to International Data Corp.'s (IDC) Angele Boyd.

"They're all in line with what users need," she says. "It's the right price point for the speed."

The old standbys

Though users are beginning to turn to direct network connections, the majority of network printers are tied to a workstation, dedicated print spooler or network server, according to the most recent IDC report on network printing.

Attaching a printer to a workstation is the best solution for one problem — placing the printer as close to the end user as possible.

Brigham & Women's Hospital in Boston uses workstation-attached printers, according to Bob Beckley, director of technology planning for the hospital. There are between 100 and 200 workstation-attached printers on the network, but that number will increase as more users are moved from terminals to personal computers, he says.

The hospital uses NetWare to support about 2,500 PC users. "We have no server-attached printers," Beckley says. "We don't distribute the servers out and about; they're all in the computer center."

There are several drawbacks to attaching shared printers to workstations. The most obvious is the drain on the designated workstation if more than a handful of users share the printer.

The workstation also has to be active for end users to access the printer. For instance, if the workstation fails, the printer would be unavailable. Reliability is another concern; workstations have to run print-spooling software, and this requires some form of memory management when it runs on the single-tasking DOS operating system. Memory management can require constant adjustments if the end user adds or removes applications.

"It would work for two days, and then it would stop working," Oregon State's Scott says. "There was a constant need for tweaking."

A way to sidestep memory management problems is to use an otherwise obsolete PC with little or no resale value as a dedicated print spooler. A print spooler receives print jobs from applications and temporarily stores them until the printer is ready to receive them. The workstation used as the print spooler does not run other applications. Inexpensive third-party software can accomplish the transformation. The principal advantage is no end-user workstation is burdened.

Users have expressed concern about the reliability of this approach, however. Dedicated spoolers usually have to be rebooted when the network crashes, and keeping old hardware running often requires a lot of attention.

Attaching the printer to a server appears to be the least desired approach, though it is very common since many network operating systems have print-spooling software that requires printers to be attached to the network server. This approach can make administrators' lives easier, but tying the printer to the server is inconvenient for end users.

"Usually, the server is not where I want the printer to be," says Don Davis, manager of microcomputer support services for Boston University.

Servers are often under lock and key, and some administrators have had to go to imaginative lengths to make server-attached printers accessible for end users.

"I've actually punched a neat round hole in a [computer room] wall," Davis says. This enabled him to run a printer cable from the server in the computer room to a printer in a more accessible area.

Upping performance

Whether the printer is attached to a workstation, a dedicated print spooler or a server, it will not work as fast as a network-attached printer, due to the limits of the parallel port.

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But changes that could give new life to the parallel port are in the works. Separate projects by HP and a group called the Network Printing Alliance are remaking the parallel port and communications protocol to provide a higher throughput and bidirectional link.

HP and Microsoft submitted to the Institute of Electrical and Electronics Engineers, Inc. a specification for a bidirectional parallel port, which the IEEE is using as the basis for a proposed standard called P1284, according to Blaine Davies, connectivity product manager for HP's Boise, Idaho, printer division. Using the specification, HP has developed the Bi-Tronix parallel port, which the company released with the HP LaserJet IV.

Separately, the Network Printing Alliance — whose members include Fujitsu Corp., IBM, Intel, Eastman Kodak Co., Texas Instruments, Inc., Castelle, Inc., Dataproducts Corp., Digital Products, Inc., Genicom Corp., Insight Development Corp., Kyocera Electronics, Inc., Lexmark International, Inc., Okidata Corp. and QMS — has proposed a parallel protocol called the Network Printing Alliance Protocol (NPAP). NPAP uses a packet format and can be transmitted over the emerging IEEE P1284 link, as well as RS-232, Ethernet, token-ring or X.25 connections.

NPAP also includes seven configuration and alert commands: Request Device Characteristics, to determine the type of printer; Request Interpreter Characteristics, to find out the supported page-description languages; Request Device Status, to see whether the printer is available and, if not, why; Printer Configuration Control, to determine or change the printer configuration such as packet size; Job Control, to delineate the beginning and ending of each job; Device Alert Status, to allow the printer to alert the server of problems; and Interpreter Message Alerts, to allow the printer's page description language interpreter to alert the server of problems.

The IEEE P1284 and NPAP or similar protocols should make attaching a printer to a workstation or server more attractive in the future, though it will still have the disadvantage of limited flexibility in where the printer is placed. Another, though less burdensome, disadvantage is that vendors developing advanced print applications will have to incorporate the new protocols.

Performance guidelines for selecting a network-ready printer
Figure 1

Number of users	Minimum pages/minute	Duty cycle (pages/month)
1 to 5	8	5,000
6 to 10	15	15,000
11 to 15	20	30,000
16 to 20	24	40,000
21 to 25	35	50,000

The number of users a printer will support is a good guideline for determining the performance it should offer.

SOURCE: GARTNER GROUP, INC., STAMFORD, CONN.

Printing strategies

Whether a printer is directly attached to the network or not, users have a few choices when it comes to developing a network printing strategy.

For the network administrator, the network opens up options for handling print queues. When multiple print jobs are submitted to a printer, they are usually handled in the order in which they were received. Since print jobs are held in a print queue, the opportunity exists to manipulate the jobs, a process called print queue management.

For example, a user executes the print command in an application. The print job is passed to a network node or network-attached printer running print server software, which places it in its queue. Given the right software, the print server then examines the print job in the queue and determines that it is a PostScript document. The print server then knows to forward the job to the next available PostScript compatible printer.

Queues can be centralized, meaning all print jobs are handled by a single server or host, or queues can be distributed, meaning print jobs are handled by multiple servers.

Centralizing print queues makes it easier for administrators to set up accounting mechanisms to track who prints what and where. The University of Pittsburgh is currently evaluating a plan to centralize its print queues in order to set up an accounting mechanism, according to Bill Fithen, data network manager for the university.

The scheme would also allow users on the university's PCs, Macintoshes, Digital Equipment Corp. VAXes and IBM computers to share the printers on the 6,000 node network.

"It would provide everyone on campus with the same printing image, regardless of what server they're on," Fithen says.

The university has already adopted PostScript as the standard output format. The college uses DEC's DECprint software to handle format translations, according to Fithen. The University of Pittsburgh is a longtime DECprint field site. However, it would not rely solely on DECprint for its centralized print queue management scheme, he adds.

DECprint is one of an emerging set of printing architectures. With DECprint, a VAX minicomputer can download fonts to any printer on the network. DECprint can also convert page-description languages.

An obvious problem with centralized print queues is vulnerability to a single point of failure, Fithen notes. To address this problem, the university is looking at redundancy to ensure the availability of the server, he says.

Another issue for users considering centralized print queues is network traffic. Centralizing queues can result in congestion on the links nearest the server.

Distributing print queues is an obvious way to avoid both network traffic problems and a single point of failure. And just because print queues are distributed does not mean print management software has to be simple.

The Medical Center of Delaware, in New Castle, Del., is in the process of deploying a universal printing scheme, according to Stan Fiedor, data communications manager. The center uses IBM and DEC computers as well as NetWare to network its PCs. The center has asynchronous printers controlled by host computers and printers attached to NetWare servers, he says.

The first phase of the center's print scheme, already completed, allows IBM 3270 and DEC users to print to the asynchronous printers and the 3270 and NetWare users to print to the NetWare server-based printers. The second phase of the project will allow users on any of the platforms to print to either type of printer, Fiedor says.

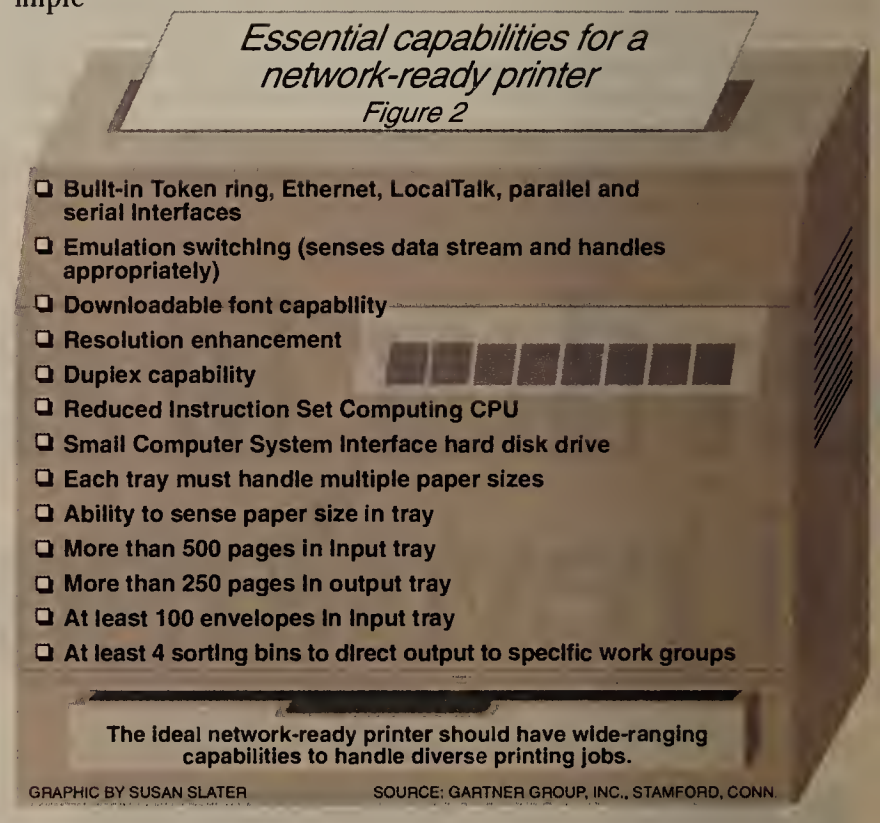
"This solution will give us the ability to send font changes and change printing from report to report," he adds.

The center does have some DEC MicroVAX print servers to handle print emulation, Fiedor says, but overall, "our philosophy is distributed queues. The printing doesn't go through any queue management."

Drawbacks to distributed print queues are difficulties in setting up accounting mechanisms and the need to distribute print server software around the network. In order to do organizationwide accounting of print services with distributed queues, each print server has to be polled by or report to a central accounting system. Distributing print management software requires configuring multiple systems as print servers.

Another option is to distribute print queues to each workstation. In this approach, each workstation runs print server software that spools its own print jobs and forwards them to network printers. This provides the most flexibility for network load balancing and eliminates the need for print servers. However, it also makes implementing an organizationwide printing scheme that much more difficult, especially for heterogeneous environments. This is because users looking for some accounting functionality would need to develop a way to poll each workstation to track their printing practices or have each workstation upload its printing log to a central node.

Essential capabilities for a network-ready printer
Figure 2



The ideal network-ready printer should have wide-ranging capabilities to handle diverse printing jobs.

GRAPHIC BY SUSAN SLATER SOURCE: GARTNER GROUP, INC., STAMFORD, CONN.

Management woes

Whichever way print queues are organized, users should have the software tools needed to manage print queues and print jobs. From the end-user perspective, the network can open up a range of possibilities, for example, by making printers with different capabilities available. The trick, according to HP's Hunt, is not only to empower the user, but also to shield the user from the complexities of the network.

Print server software should have the ability to detect job characteristics — for instance, the requirement for legal size paper — and forward the job to an appropriate printer. However, if that printer is busy or disabled, the software should not automatically forward the job to another printer, according to Hunt. Instead, it should recommend alternatives to users and provide them with the physical locations of the alternate printers, letting the users decide if they want to wait or walk.

On the whole, architectures such as NewsPrint and DECprint meet these requirements. They are moving the intelligence for controlling printing from the printers themselves into the network. This helps keep the processing load, and, therefore, printer hardware cost down by preserving existing printers or making it possible for users to get away with less expensive models rather than the high-powered net-ready printers. It also allows organizations to include in their print management schemes those low-end printers that are already distributed around the network.

Although print architectures such as NewsPrint and DECprint are flexible and encompass a range of printers, there are also benefits to network-ready printers. Even if users hesitate to adopt a vendor's printing scheme or develop their own, network-ready printers enable users to take advantage of the network.

Printers are, by and large, already on the network. Users can think of printing as an annoying fact of network life, or take a more productive approach and recognize that networks can be a boon to printing.

Smalley is a Boston-based free-lance writer.

> A problem with centralized print queues is vulnerability to a single point of failure.
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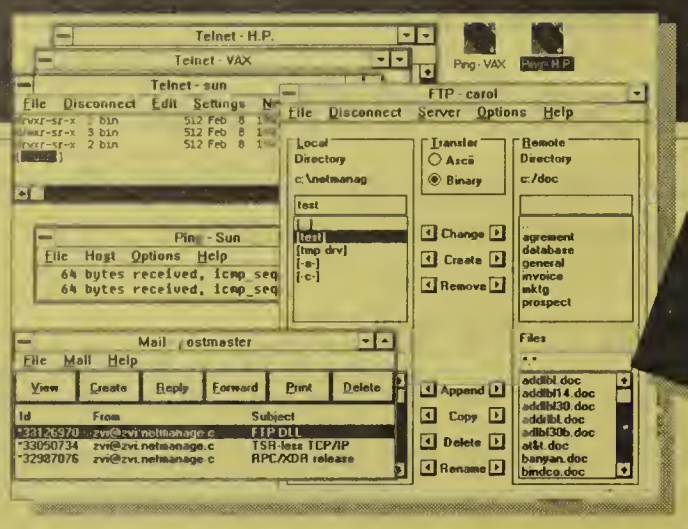

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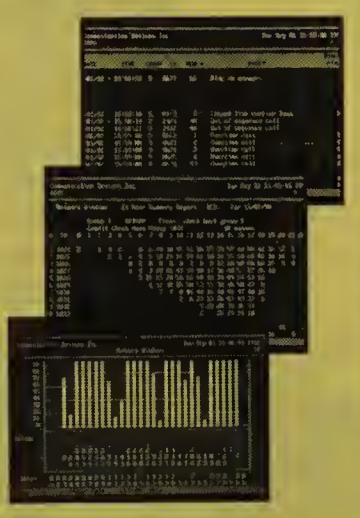

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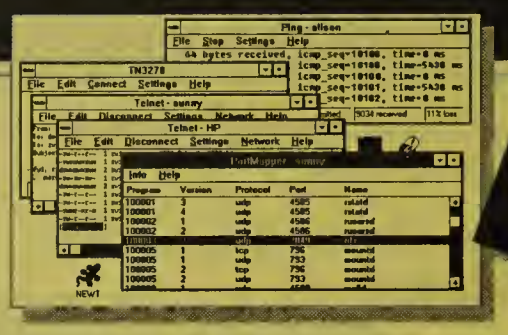

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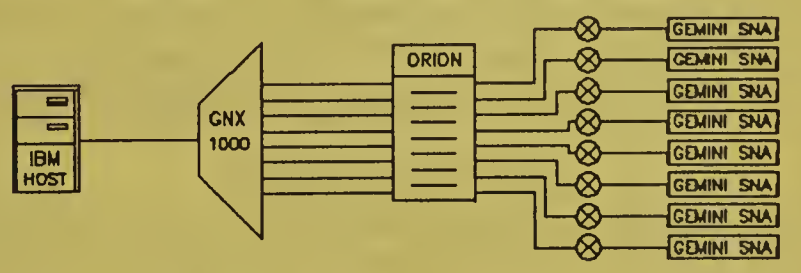

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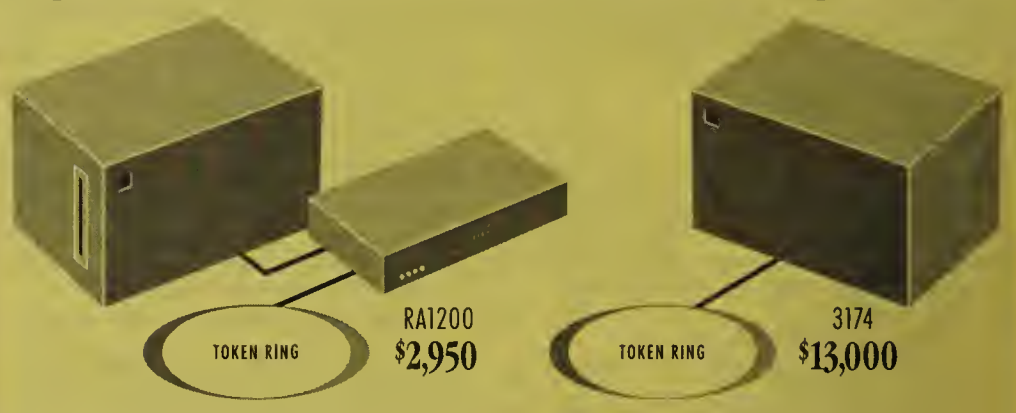

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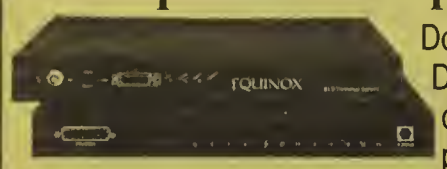

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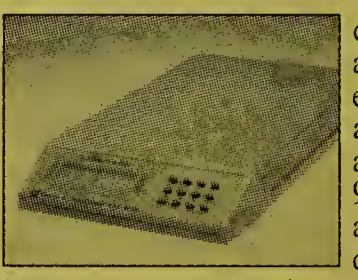

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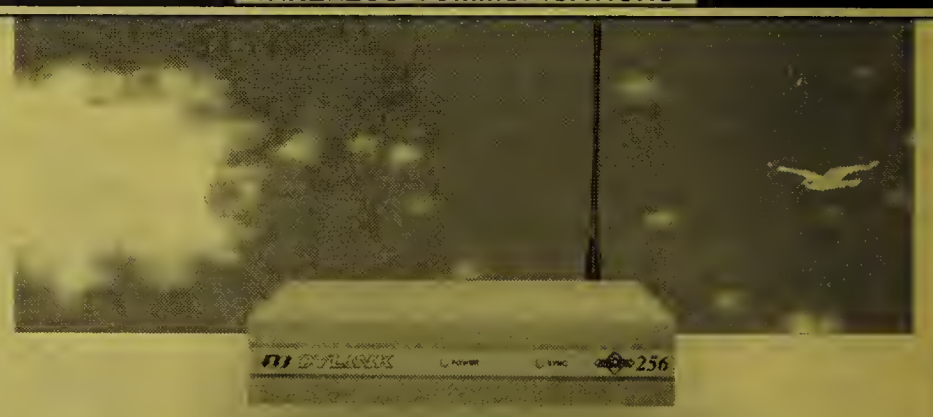

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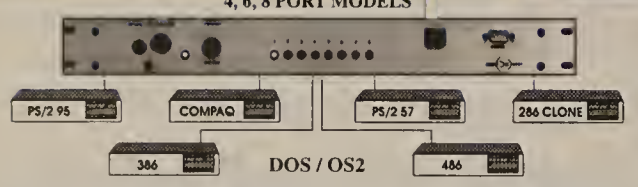

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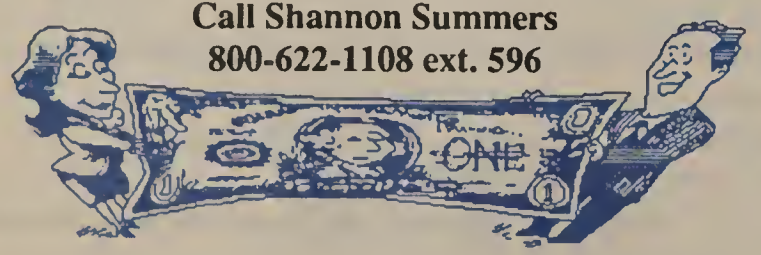

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Venture will build switches

continued from page 1

be called HSS, may be commercially available later this year.

The switch, however, will have little impact on Sprint's ability to roll out ATM service since the carrier is apparently not interested in using it in its net. Instead, Sprint will push the HSS as a backbone switch for large corporate networks and small carriers, said Dave Dorman, president of Sprint's major accounts group.

According to Dorman, the HSS will provide customers of Sprint's Telenet TP family of X.25 and frame relay equipment with an important growth path. "Customers who use the TP hardware want the capability to evolve," he said. The HSS will be backward-compatible with all Sprint's Telenet TP products now in use.

But the new joint venture has raised questions about exactly how Sprint will meld a cohesive network plan for ATM service and which switches it intends to use.

Sprint was scheduled to roll out ATM service in mid-1993 for the Department of Energy (DOE) and commercial customers using a modified version of TRW, Inc.'s Broadband Access Switch 2010.

In an interview with *Network World* in January, Howard Stern, director of market analysis for Sprint Data Group, said the carrier planned to upgrade its Telenet TP switches to provide ATM service. Sprint currently uses the TP4900 packet switch to support its frame relay service.

The HSS announcement also raised some questions about whether Sprint ultimately intends to back away from the TRW switches and use its own.

Paul Callahan, senior analyst at Forrester Research, Inc., believes Sprint chose the TRW switch for its initial ATM deployment primarily because TRW had a product available in the time frame required by the DOE.

Callahan said he has been briefed on Sprint's ATM strategy and believes the carrier intends to use smaller switches, such as the TRW product, as an access switch and will later supplement that with even larger network switches once ATM takes off.

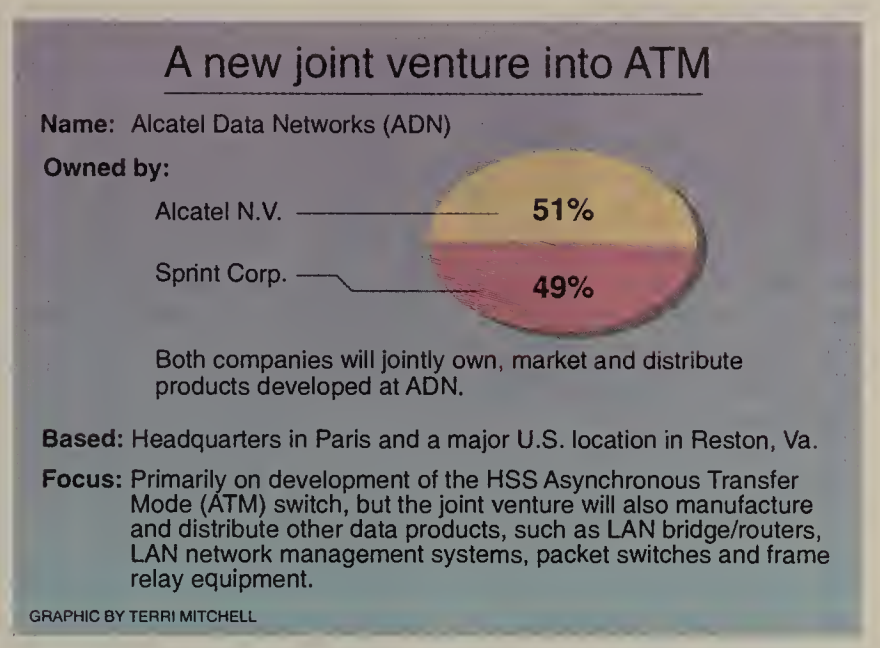
That scenario would be similar to what AT&T annouced last month, he said. AT&T plans to use StrataCom, Inc.'s BroadbandPX ATM switch and its IPX-32 fast packet T-1 multiplexer as feeder nodes to its own GCNS 2000 ATM backbone switch.

Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy, said, "It is not Sprint's intention to deploy the HSS in their public net because it will be smaller than the TRW switch," he said.

There are probably about 400 firms in the U.S. that would be able to use an ATM switch in private nets, according to Nolle. Sprint and Alcatel estimated that between them they have 300 prospective HSS customers that could be prospects for the HSS.

Last week, Dorman conceded that Sprint has not made a final decision on which switches to use for ATM. "Since we own 49% of ADN, we will have to look carefully at deploying that [ATM switch] in our own network," he said. But Dorman added that Sprint has not ruled out using switches from TRW or other vendors simultaneously in its network.

Callahan and Nolle said they saw no reason why Sprint could not roll out ATM this year, despite the questions about switch selection. However, Nolle questioned whether it is worth rolling out the service now. "The number of businesses that have a credible demand for ATM service now is statistically insignificant," he said.



Start-ups target '93 needs

continued from page 24

ket. With shipment last December of EcoTools/Oracle, its software product for monitoring Oracle Corp.-based applications, the firm began cutting a swath through the jungle of distributed computing.

Operating on a Unix-based platform, EcoTools/Oracle provides a way to examine the configuration of remote clients accessing the database and the server the database is running on. EcoTools/Oracle also provides performance and fault management for the database application, all through a single graphical user interface.

By year end, EcoSystems plans to release similar software products based on its underlying core technology, EcoSphere, for monitoring Informix Software, Inc. and Sybase, Inc. database management systems.

"Users are almost universally finding management of these systems to be much more of a headache than they had envisioned," said Fred Joy, a senior research analyst at META Group. "EcoSystems has a new idea for a distributed environment, one that probably all the vendors will adopt."

That idea is EcoSystems' recognition of the relationship between net performance and database performance. Its products are designed to monitor not only the hardware, but the software and the network used to support the distributed system, Joy said.

A handful of companies, including Candle Corp., are addressing parallel concerns in mainframe systems development, but the problem is exponentially greater for distributed systems, he added.

"Users can't afford to put database management systems in each office," said John Howorth, a spokesman for EcoSystems, adding that EcoTools/Oracle offers the means to centralize systems management in one office for a distributed system.

EcoSystems did a fairly extensive beta test of its product, fielding it at about 12 user sites.

— Ellen Messmer

EcoSystems Software, Inc.

Based: Cupertino, Calif.

Founded: 1991

Primary business: Systems management for client/server applications

EcoSystems Software, Inc.

IBM shores up net mgmt. wares

continued from page 2

the larger NetView/6000, such as the ability to automatically map, track and graphically display network problem conditions, configurations and alerts. NetView/6000 pricing starts at $10,450, while the Entry version, which will be available in March, will sell for $4,500.

IBM also rolled out a trouble-ticket application that can run on the Entry or original NetView/6000 platform. Trouble Ticket/6000 includes an Ingres Corp. database that stores change and configuration information and tracks problems from inception to repair.

PHOTO ©1993 WALTER CALAHAN
Bill Warner

"In the past, NetView/6000 users could only track limited historical information about devices and there was no problem management data available," said Bill Warner, IBM networking systems director for enterprise management.

Version 1 of Trouble Ticket/6000 is available for $12,500.

Analysts said the NetView/6000 enhancements establish IBM as a multivendor management leader.

Also at ComNet, IBM and BT announced availability of the first products that will let IBM's NetView and BT's Concert Network Management platforms exchange net management information.

The firms will use IBM's Network Carrier Interconnect Manager and Agent software to integrate the two platforms. The Carrier Interconnect Manager runs on the IBM mainframe and works with the Agent software on the BT system to translate net management data coming from either system into a format the other can understand.

For problem reporting, BT will also support IBM's Problem Management Bridge (PMB), which translates IBM's Information/Management database files into a format the Concert system understands. PMB costs $15,000.

Initially, the two platforms will exchange only net event information, but the companies will add command and control features as well as trouble-ticket applications later this year.

BT's Concert joins AT&T's Accumaster Integrator as the second carrier management platform to work with IBM's Carrier Interconnect Manager. Although the firm did not reveal pricing, IBM's Carrier Interconnect Manager is currently available for $15,000 and the Interconnect Agent costs $50,000.

On the 6611 front, IBM said it met its scheduled shipping date last month for a new software release, Multiprotocol Network Program Release 1.1, which supports remote transparent bridging of AppleTalk Phase 2 and Network Basic I/O System protocols over 802.3 and Ethernet Version 2 local-area networks. It also supports TCP/IP's Border Gateway protocol, which lets users route data between two or more autonomous or disparate TCP/IP nets.

IBM said Release 1.2 will be available March 26 and will include, as scheduled, support for Advanced Peer-to-Peer Networking Network Node and new support for routing Systems Network Architecture and NETBIOS data over Ethernet LANs using Data Link Switching (DLS). Today, DLS only handles traffic from token-ring LANs. DLS acknowledges receipt of SNA frames and handles the link-layer flow controls for SNA sessions.

IBM also announced that the 6611 has been certified by Novell, Inc.'s NetWare Tested and Approved program to route the IPX protocol over Ethernet.

Survey points to net strategy

continued from page 25

management, LANs and carrier services. "There must be a lot of internetworking vendors out there," Myhre quipped.

The study also found a shift in enterprise net architectures away from IBM's Systems Network Architecture and toward multivendor network solutions based on the Transmission Control Protocol/Internet Protocol and Open Systems Interconnection protocols.

The study concludes that respondents find many business benefits in an enterprise network strategy but also many roadblocks to its implementation (see graphic, page 25).

The vendors, however, differed greatly from the users in this category. Where the users cited budget constraints as the major obstacle, the vendors overwhelmingly cited organizational politics.

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Plans leave some wondering

continued from page 1

multiplexers and cell switches such as its recently announced Broadband PX and AT&T Network Systems' GCNS-2000.

At the press conference to announce InterSpan ATM, AT&T stressed its commitment to the technology and said it will offer ATM services that run at up to 622M bit/sec.

However, AT&T would not say when the offerings will be available. The carrier also would not say how many StrataCom and AT&T Network Systems switches it will use to support ATM, nor would it divulge how much money it will spend to deliver InterSpan ATM.

Although AT&T has announced facets of its ATM strategy in a piecemeal fashion over the last several weeks, prospective AT&T InterSpan ATM customers and others last week said they need to know more.

"This is a nonannouncement as far as I'm concerned," said Don Rees, vice president in charge of operations for the First National Bank of Maryland in Baltimore. "I don't see any pricing or any hard dates for availability, and have no idea how widely they will deploy the service."

Other users said AT&T's ATM plans needed more meat.

"The horizon of ATM is fuzzy right now, but it's slowly beginning to come into focus," said John Boyd, supervisor of communications systems with Northeast Utilities, a Hartford, Conn., power company. "Users can project when ATM will become available, but they can't start planning its role in enterprise networks."

PHOTO ©1993 WALTER CALAHAN
JoAnn Patrick-Ezzell

Although some customer premises equipment vendors have shipped ATM products or detailed their ATM strategies, local and interexchange carriers have not kept pace ("To users' dismay, carriers mum on ATM service plans," *NW,* Jan. 11).

Before the AT&T service announcement, only Sprint Corp. had committed to an ATM service. Sprint may be first to market with ATM, which it said will be generally available by the end of the year.

According to analysts, AT&T is moving along cautiously with ATM.

Illustrative of that was the carrier's creation of the AT&T ATM Customer Advisory Council, a group of large users working with AT&T's service planners to assure that InterSpan ATM meets customer needs. The group, including representatives of Northwest Airlines, Inc. and Halliburton Co., will participate in early trials and controlled service introduction.

"This shows AT&T doesn't have a good handle on how much demand there will be or what applications companies will use its ATM service to support," said Steve Sazegari, an analyst with Ryan Hankin and Kent, Inc., a San Francisco-based consulting and research firm. "But I have to give AT&T credit because they're making sure in advance that the service will be used, something they failed to do with ISDN."

Conspicuously absent from AT&T's discussion of its network evolution was Switched Multimegabit Data Service (SMDS).

"There isn't any demand for SMDS, so we don't plan to [offer] it," said Patrick-Ezzell, marketing vice president for AT&T's InterSpan Data Communications Services.

NET offers scaled-back mux

continued from page 1

neling and SDLC-to-Logical Link Control (LLC) conversion capabilities.

NET's new Synchronous Optical Network multiplexer, the SONET Transmission Manager/S (STM/S), was developed by Adaptive Corp., a wholly owned subsidiary that makes broadband switching and transmission gear.

The STM/S is designed for sites that need less than eight T-3 links, NET said, whereas its predecessor, the STM/18, supports up to 18 T-3s. Both products allow private network users to consolidate multiple T-1s into a single T-3 pipe and carriers to offer a range of broadband networking services, NET said.

Analysts said NET needed to bring out a lower capacity SONET mux because the STM/18 is too expensive and has too much capacity for most users.

Demand for T-3 trunking has been spotty at best, the analysts said, because tariffs are expensive. Hence, sales of the STM/18 have been undercut by lower end offerings from T3plus Networking, Inc. and, to some extent, NET's own IDNX/90, which supports four T-3s ("NET may absorb Adaptive sooner than first planned," *NW,* Dec. 21, 1992).

"If there's anything NET has done that's gotten them into trouble in the marketplace, it's chasing the high-end user," said Thomas Nolle, president of consultancy CIMI Corp. in Voorhees, N.J. "The higher end product was drastic overkill."

Nolle is not optimistic that the STM/S will be successful either, noting that the current market for SONET products is even smaller than that for T-3 switches.

The STM/S has a SONET-based switching fabric with a capacity of 744M bit/sec. In addition to the eight T-3 links, the mux sports up to 96 T-1 lines. It also houses eight High Speed Serial Interface ports that operate at up to 49M bit/sec each and 48 V.35, RS-449 or EIA-530 ports, which support line speeds up to 12.2M bit/sec.

Like the STM/18, the STM/S supports multimegabit inverse multiplexing. It synchronizes multiple switched T-1 channels at each end to produce a contiguous pool of bandwidth of up to 49M bit/sec that can be dedicated to a single application or device.

The STM/S also supports what NET calls bandwidth racheting. This capability allows users to allocate a fixed amount of bandwidth for priority traffic, such as Systems Network Architecture data, while dynamically assigning the remaining bandwidth to other applications.

The STM/S is compatible with AT&T's Accunet T45 service. NET is currently testing the STM/S for compatibility with AT&T's Accunet fractional T45 service.

NET also brought out a SONET Optical Carrier (OC)-3 board for the STM/S and STM/18. The one-port board allows STM users to connect to carrier SONET services at 155M bit/sec.

The STM/S will be available in April. Pricing will range from $60,000 to $150,000. The SONET OC-3 interface costs $18,000. It will be available later this year. By contrast, the STM/18 is priced from $70,000 to more than $200,000.

Meanwhile, the new LWX software, Version 2.01, converts SDLC data streams to the 802.2 LLC format so that SNA traffic can travel over token-ring local-area networks and internets. The software also supports the local acknowledgment of LLC and SDLC packets on behalf of remote nodes, thus reducing wide-area network traffic.

LWX 2.01, which was licensed from Cisco Systems, Inc., is available now as a free upgrade for LWX users. SDLC conversion is an option that costs $700.

Canadian carrier first for 7000

continued from page 2

Jan. 18).

Bashir said he had been after Cisco for more than a year to develop a more reliable, higher performance router and is pleased with what Cisco delivered.

Unitel is using the 7000 to connect two data centers, each of which houses a variety of local-area networks.

Each router is supporting nine LANs — six Ethernets, two token rings and a single FDDI. On the wide area, each is supporting 16 T-1 interfaces. The 7000 is handling Unitel's four key protocols, including the Transmission Control Protocol/Internet Protocol, DECnet, Internetwork Packet Exchange (IPX) and IBM's Systems Network Architecture, which is encapsulated in TCP/IP.

The routers are handling traffic from digital access and cross-connect systems in the data centers and providing LAN-based users with access to applications on the IBM 3090 mainframe in each data center.

Like the existing Cisco routers currently in Unitel's net, Bashir said the 7000 is being managed via the vendor's CiscoWorks router management software.

The 7000's on-line servicing capabilities, such as hot-swappability and backup power protection, will enable Bashir to do upgrades while the router is operating.

Bashir said the 7000's higher throughput speeds — up to 250,000 packet/sec by next year — will enable it to support Unitel's growing requirements for High Speed Serial Interfaces at speeds up to T-3.

Bashir said the 7000 also overcomes some of the slot space limitations he ran up against with the AGS+, particularly with token ring, and diminishes the need to buy additional chassis.

A final significant improvement of the 7000 over the AGS+ lies in the 7000's interface cards, which now come equipped with outboard electronics for physical-layer functions, Bashir said. These connectors attach to the back panel and link to the router's internal cables, enabling Bashir to install new interfaces within minutes.

Previously, the interface card and applique that physically attaches the LAN to the interface were separate and required a laborious assembly process.

In addition to linking the data centers with the 7000, Bashir said Unitel will soon begin replacing the AGS+ routers currently housed at each of Unitel's major hub sites with the 7000 in a collapsed backbone configuration.

Hughes takes off with ATM plan

continued from page 1

way [Hughes Chairman Michael Armstrong] wants it to function."

The company hopes to be able to cost-justify the move to ATM by developing applications for the entire company rather than on a business unit basis. It also expects to reap savings by swapping out underutilized private lines for ATM services, which provide bandwidth on demand.

> "I'm moving to position this company as solidly as I can behind ATM," Buchanan said.
>
> ▲▲▲

Hughes, which chose to bypass both frame relay and Switched Multimegabit Data Services as possible transitional services, is emerging as a major ATM market driver.

The company is working closely with a number of vendors under nondisclosure to articulate its needs and help drive vendor development efforts and is spearheading the formation of an ATM user group. The Enterprise Network Users Roundtable will meet for the first time on Feb. 18 in Millbrae, Calif.

"I'm moving to position this company as solidly as I can behind ATM," said Buchanan, whose organization released to the public a white paper describing the company's reasons for choosing ATM.

RFPs for ATM

The RFPs issued by Hughes are for the components of a prototype ATM network scheduled to be completed this summer. Targeted equipment includes multiple types of ATM hubs, carrier services, network management based on the Distributed Management Environment standard and other assorted devices.

The prototype should be running production traffic by July, supporting several thousand users across multiple business units.

The net will enable Hughes to better determine the requirements of the production ATM network, which it hopes to start building next year and finish by 1997.

The Hughes Enterprise Network Architecture outlines a two-tiered network based on ATM. Lower tier "site hubs" will serve work groups and top-tier "core hubs" will be used to form a backbone linking site hubs and providing access to public ATM carrier services.

Buchanan said the site hubs will need to provide ATM to the desktop and spit out 53-byte ATM cells onto the backbone. The hubs will have ATM backplane buses as well as buses for traditional local-area network traffic. The hubs will have to provide routing, security and protocol encapsulation capabilities.

Core hubs will boast an ATM switching fabric that can accommodate applications, such as compressed and broadcast video, that require high bandwidth.

The network will be designed to connect with a collection of existing devices and network types, including X.25, token ring, IBM Systems Network Architecture and Fiber Distributed Data Interface.

For a copy of the Hughes requirements document, contact Donald O'Neal, communications director for Hughes' Space and Communications Co. at (310) 364-5777, or fax (310) 364-6397. For information on the Enterprise Network Users Roundtable, call (310) 364-6582, fax (310) 322-4294 or message via the Internet to 72130.1217@compuserve.com.

Mgmt. software cuts time, costs

continued from page 6

choose among any images that have been scanned into the package using either a dedicated workstation scanner or a network scanner. Skok said the package contains drivers for most popular scanners.

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When the mail recipient double-clicks on the sketch, Watermark is automatically loaded on the recipient's workstation. The image is then retrieved from the server and displayed on the workstation, where the user can annotate it using a variety of tools, such as an electronic yellow highlighter or red pencil, or type in plain text.

Watermark will be available in the second quarter and comes in two versions. The server component of the Discovery Edition is designed for limited image use. It costs $149 per user or $1,295 for a 10-user version.

The server of the Watermark Professional version is intended for more image-intensive use and is designed to run on a dedicated image server. It costs $300 per user or $100 per user in quantities of more than 100.

CrossComm to build up APPN

continued from page 1

tage of the Address Processor & Directory engine CrossComm has built into its ILAN family of routers.

The engine is used to store hardware information about each device on the net, making it possible for the routers to quickly find the most efficient path through large networks.

CrossComm's proprietary Discovery SPF algorithm will work hand-in-hand with the PIR to discover the optimal routing path and boost APPN routing by providing ILAN nodes with the ability to route around failed links in less than 10 seconds.

A major drawback of APPN today is its inability to dynamically reroute sessions around failed components or to employ a new route as links become congested or better routes become available.

IBM intends to overcome these deficiencies when it releases in mid-1994 High Performance Routing — formerly called APPN+ — which will provide a three- to tenfold net performance improvement.

Anura Guruge, an independent consultant in New Ipswich, N.H., said PIR "has a synergistic feel with APPN because once you put APPN on top of [PIR], you add benefits that are lacking in native APPN, such as dynamic alternate routing, additional load balancing and congestion control."

Squarely in the Blue camp

Koss said CrossComm licensed the Network Node to better respond to the needs of a customer base that consists almost exclusively of IBM users. "APPN is the blueprint for many of our customers, so we felt it was critical to align ourselves with IBM and ensure that we have the intellectual property rights to APPN, along with accompanying interoperability testing and support from IBM."

3Com Corp. was the first router vendor to license and beta-test the APPN Network Node software.

Koss said CrossComm investigated the alternative to APPN — dubbed Advanced Peer-to-Peer Internetworking (APPI) — being pushed by a group of vendors led by Cisco Systems, Inc. but decided against it.

APPI combines SNA peer-to-peer networking with Transmission Control Protocol/Internet Protocol features and is heralded as a way to provide vendors with APPN-like functionality on their routers without having to pay IBM a licensing fee.

Videoconferencing rollouts abound

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ing on the number of users.

CLI also offered a few more details about at its soon-to-be-announced Eclipse videoconferencing system.

Ken Hollen, executive director of marketing, said the low-cost unit will be based on chip technology similar to that in its Cameo product and support a variety of high-end functions, including extra audio ports, echo cancellation, extra video ports, a net interface, graphics capability, and support for multipoint bridging and a video cassette recorder.

"It will be priced about 50% less than the Model 150," he said, referring to PictureTel's recently released low-end model. A similarly equipped Model 150 would cost close to $25,000.

PictureTel used the show to announce a cascading option for its M-8000 Multipoint Bridge. The feature makes it possible to link as many as 17 M-8000s and support a maximum of 120 simultaneous conferences.

The cascading capability is available now and ranges in price from $5,000 to $13,500 per port, depending on other required options such as encryption. Existing bridges can be field-upgraded.

AT&T rolled out Accumaster Videoconferencing Management Services, under which it will reserve and schedule videoconferencing rooms, procure and maintain videoconferencing equipment, and manage wiring and cabling. It will also design videoconferencing networks and construct videoconferencing rooms.

Accumaster Videoconferencing Management Services is available now in North America. The carrier plans to expand the service internationally this year. Contracts typically range from three to five years.

Sprint joined the videoconferencing fracas with the announcement that its Switched Video Service Bureau will now support transmission speeds of 336K and 384K bit/sec. Before, the service supported only 112K bit/sec.

The service is a dial-up offering designed to overcome incompatibilities in videoconferencing services and equipment.

The enhancement, available next quarter, is only for customers using either Sprint's SP3310/SP3320 inverse multiplexer or one of Ascend Communications, Inc.'s muxes to aggregate bandwidth.

Pricing for the enhancement has yet to be set.

Advantis adds connectivity

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point protocol. The backbone supports link speeds of 56K, 256K, 512K and 1.544M bit/sec.

Until now, Advantis offered only SNA backbone services with leased-line access speeds up to 1.544M bit/sec and dial access at speeds from 300 to 19.2K bit/sec along with X.25 service.

"We're now offering users the benefits of a multivendor backbone without making them invest in all of the resources needed to install and manage that backbone," said Dave Kamm, director of the LAN Internetworking Solutions service. "Enterprise networks increasingly need the client/server LAN-to-LAN communications that our new high-speed WAN provides."

Pricing for the new services was not available at press time.

Advantis also announced ShowBBS, an on-line interactive bulletin board that lets users send messages and electronic mail to other Advantis clients, employees and suppliers. Users can also utilize the ShowBBS to order services from Advantis.

NETWORK WORLD

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161 Worcester Road
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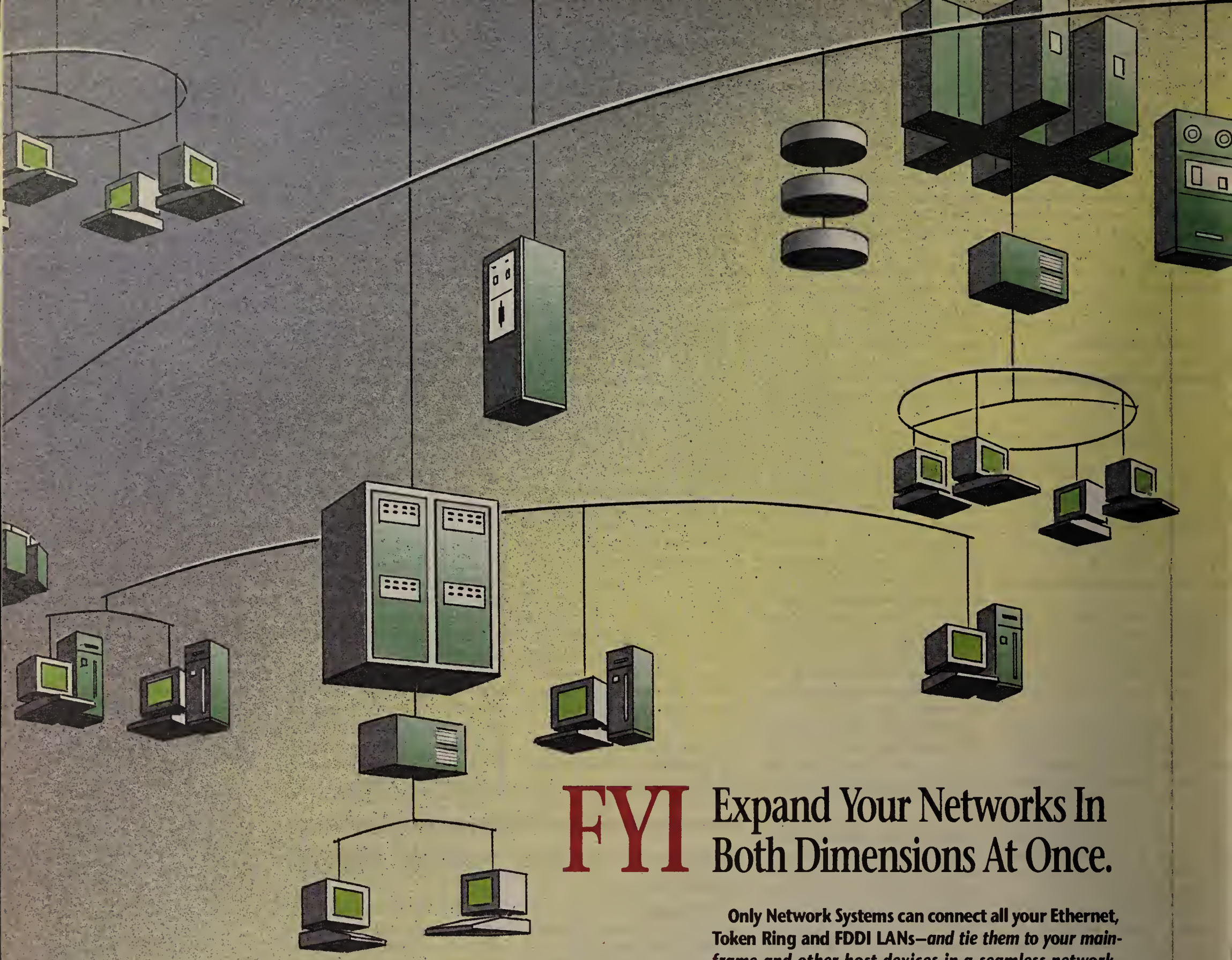

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